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MAY/JUNE 1991

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LETTERS

Dear Editor:

I enjoyed the informative profile on Round Hill Winery in the March/April'91 **PWV**. The Gomberg-Fredrikson report shows a 13% increase for that brand in 1990 and a 2% increase in 1989 in a tough marketplace, so clearly things are working for Round Hill.

However, I question one point: Jim Cahill's "education of wine spokespersons" strikes me as a euphemism akin to 'revenue enhancement' for taxes, or 'collateral damage' for injured civilians.

If the wine writer sees confusion, then by definition there is confusion. Are we going to tell the writer he is not confused? One would hope the writer could recognize confusion.

With all due respect to the obviously successful people at Round Hill, I think this attitude is widespread in our industry and hurts our marketing efforts. It is time to stop disagreeing with writers and consumers and start paying attention to their views of our products.

Warm regards,
Daniel Wilson, President,
Innovative Wine Marketing, Inc.

Dear Editor:

I'm addressing this letter in reference to the March/April'91 **PWV**. In the past year I've seen many articles written about 'Organic Wines.' I've hoped that the misinformation and confusion about organic wine processing and how it relates to Federal and State law would sort itself out. Assuming that a diligent reporter would do the proper research and not simply reprint a winery's press release.

I'm now especially concerned that **PWV** readers may be misled by the information in the 'organics' report on page 22. We at Hallcrest Vineyards produce wines that are processed traditionally from organically grown grapes, **and** organically processed wines from organically grown grapes, (in accordance with California state law).

We did eight months of research to understand what the consumer and the State of California defines as an organic food, before committing ourselves to producing organic wines. Although at times vague, our research has found that there is a definition for organic wine in both the previous and current California state laws, and the Federal Organic Foods Production Act of 1990.

Let us first try to understand the definition of a 'processed food.' What we in the wine industry think of as 'produced,' (the

Continued on page 67

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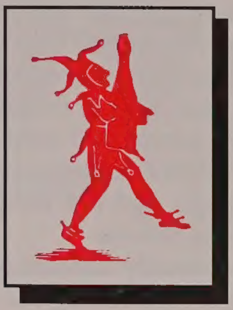

Jake Lorenzo

Dear Editor:

You say Jake isn't funny? So what? There's a time to laugh and a time to cry. Times used to be better for laughing.

Jakes sees this and it hurts him inside. He says he's a detective, but what does he detect? As far as I can see, he detects best the mysteries of the soul. His hard-boiled front should fool no one, for if he's not a poet, he'll do until one comes along.

Where has all the fun gone? Jake is asking. Tough question from a tough guy. If Jake needs help with that second bottle, let me know.

Meanwhile, space for Jake should be a priority!

Best regards,
B. Sessions

Dear Editor:

*The Jan/Feb'91-**PWV** was better than usual, especially Jake Lorenzo's lamentation. I have written to you before complaining about **PWV**'s focus on the big wine industry. I am with Jake, and I rage, rage, rage every day — for, the military complex and the industrial complex of our country are the enemies of what wine truly is.*

Keep the faith, Jake! and you will find a niche in the hull of Noah's ark, and after the next great flood, the great earth will welcome you back, there will be vineyards again, and the blood of the land will be wine again.

Sincerely,
C. Dobson

Dear Editor:

I am deeply affected by Jake Lorenzo's latest column. It seems he is suffering from the same bewilderment and frustration that many small winery owners feel. It goes beyond my understanding how the big guys can continue to keep quiet about the mess going on in government over alcohol, in general, wine specifically. Here in the Finger Lakes, I am, along with another small winery owner, attempting to establish a nationwide march on Washington. I will keep you posted on developments.

T. Pellechia
Hammondsport, NY

Readers are invited to write to the editor or directly to Jake Lorenzo, C/O **PWV**, 15 Grande Paseo, San Rafael, CA 94903-1534

With this column, Jake Lorenzo pops his cherry. That's right, you are reading the first Jake Lorenzo column created on a computer.

I'm sure this comes as a big shock for all of you sophisticated wine types who seem to have been born with computers. I remember being in a very large winery last year. I was waiting to take the winemaker to a baseball game. I was in a warm, carpeted room with several computer terminals buzzing away atop very modern, fancy desks.

Well, you know Jake, always the garrulous type. I asked one of the computer operators what his job was. "Assistant winemaker," was his reply.

"What are you doing?"

"I'm doing a blend," he said.

Trust me, this guy has never had wine-stained fingers. He's never had the cellar chill seep down into the marrow of his bones until only an early morning Irish coffee could thaw it out. This guy has never even thought about buying a pair of rubber boots, but this son of a bitch really thought that he was making wine. He worked it out on his computer.

Let some poor, cold, dumb cellar rat hook up the hoses, clean the tank, gas it, and make sure it's topped. If the idiot can just follow the printed instructions, the wine will be perfect.

Believe me, it was an experience that chilled Jake Lorenzo to the bone. Of course, I used the experience to force the winemaker to pay for all the beers at the ballgame by threatening to reveal his sordid winemaking practices.

Actually, I've always been fond of computers. In fact, way back when I was a teenager, I worked for my uncle's data processing company. I worked with this great guy named Benny. We were burster operators.

In those days everything a computer printed rolled through on computer paper, even paychecks. The burster was the machine that tore the sheets and then stacked them in order.

The main requirement for being a burster operator, at least as far as my mentor Benny was concerned, was to be able to cuss like hell in several different languages every time the burster stopped tearing the pages in the right place and started eating the reports that all the high-paid programmers were waiting for in their nice, warm, carpeted offices.

Smart programmers would be very nice to Benny and me. They would bring us a beer now and then. They would get us one of the company tickets to ballgames. Occasionally, they'd let us go with them to the bars where they always picked up the tab.

The other programmers were always having trouble with their reports. Pages were constantly getting chewed up by the burster, or the burster would stack their pages out of sequence, or the payroll checks for their big account with the 2,000 employees would somehow have huge chunks torn out by the terrible burster.

Of course, they were all high-paid computer programmers sitting in their warm, carpeted offices, and they certainly couldn't concern themselves with those poor, dumb burster operators.

Is there a moral to this story? No doubt, but what I was getting at was I've decided to use computers at this late date, because I'm convinced that the technology has progressed to the point where it **won't** change my life.

Computers are so sophisticated that I don't need to know anything about them. I just get my friendly computer guy to load the program, show me how to work it, and I'm off.

I've learned it doesn't matter how proficient you are at one thing, when you get started on something new, you tend to have no confidence in your ability to succeed. I suppose that's why my uncle, who is now retired, called me to ask about setting up a wine cellar for his grandchildren.

Setting up a cellar for children is a commendable practice, and Jake Lorenzo certainly wants to encourage more people to set them up. However, I'm convinced that most people are going about this all wrong.

Most people buy a bunch of great wine from the birth year vintage of their child (or grandchild). Then they sit around for 21 years waiting for the kid to come of age so they can lay all this wine on him. I would assume that most of the wine has gone bad, so the kid's first experience with fine wine is anything but enjoyable.

Jake Lorenzo has a much more sensible program. Go ahead and buy the wine from the kid's birth year, but as soon as the kid is able to reason, take him down and show him all those bottles. Let him touch them. Let him look at the labels. Explain that all of this will someday be his.

When the kid is a teenager and screws up — you know, stays out too late or flunks computer class — then take him down in the cellar. Pick out one of his bottles of wine. Open it and drink it in front of him. Tell him how good it is and what a shame it is that he'll never get a chance to know how good it is.

This will teach your kid about the true value of wine. He'll be able to watch the real pleasure you get from drinking a fine wine. This way the wine cellar becomes a valuable educational tool. Believe me, that kid will treasure any of the bottles that might be left when he reaches 21.

By the way, I'd like to enlist your help for a friend of mine. His name is Kieran Toovey. He's a little more than two years old now. He's talking pretty well, although most of what he has to say seems to come from "Mutant Ninja Turtles" or Disney's "The Little Mermaid".

Kieran's dad was Tracy Toovey who was murdered by Ramon Salcido in April, 1989. Kieran isn't going to remember his dad; he was too young when Tracy was killed. I thought it might be a nice gesture if those of us in the wine business built a cellar for Kieran.

Kieran's birth year was 1988. As you release your 1988s, what do you say — send a bottle or two to Cathy Toovey for 'Kieran's Cellar'. When he is older, I think Kieran will be impressed to see how many wineries have sent bottles in honor of Tracy. He still won't know his father, but he will know that a lot of us thought Tracy was a hell of a guy.

If nothing else, I know you'll be doing Cathy a favor. If I'm any judge of character, Kieran's going to have her down in the cellar often, watching as she drinks one his bottles and listening as she explains how good it would have been.

Don't wait — take the time to send the wine to Cathy Toovey, c/o Kieran's Cellar, P.O. Box 922, Glen Ellen, CA 95422. ■

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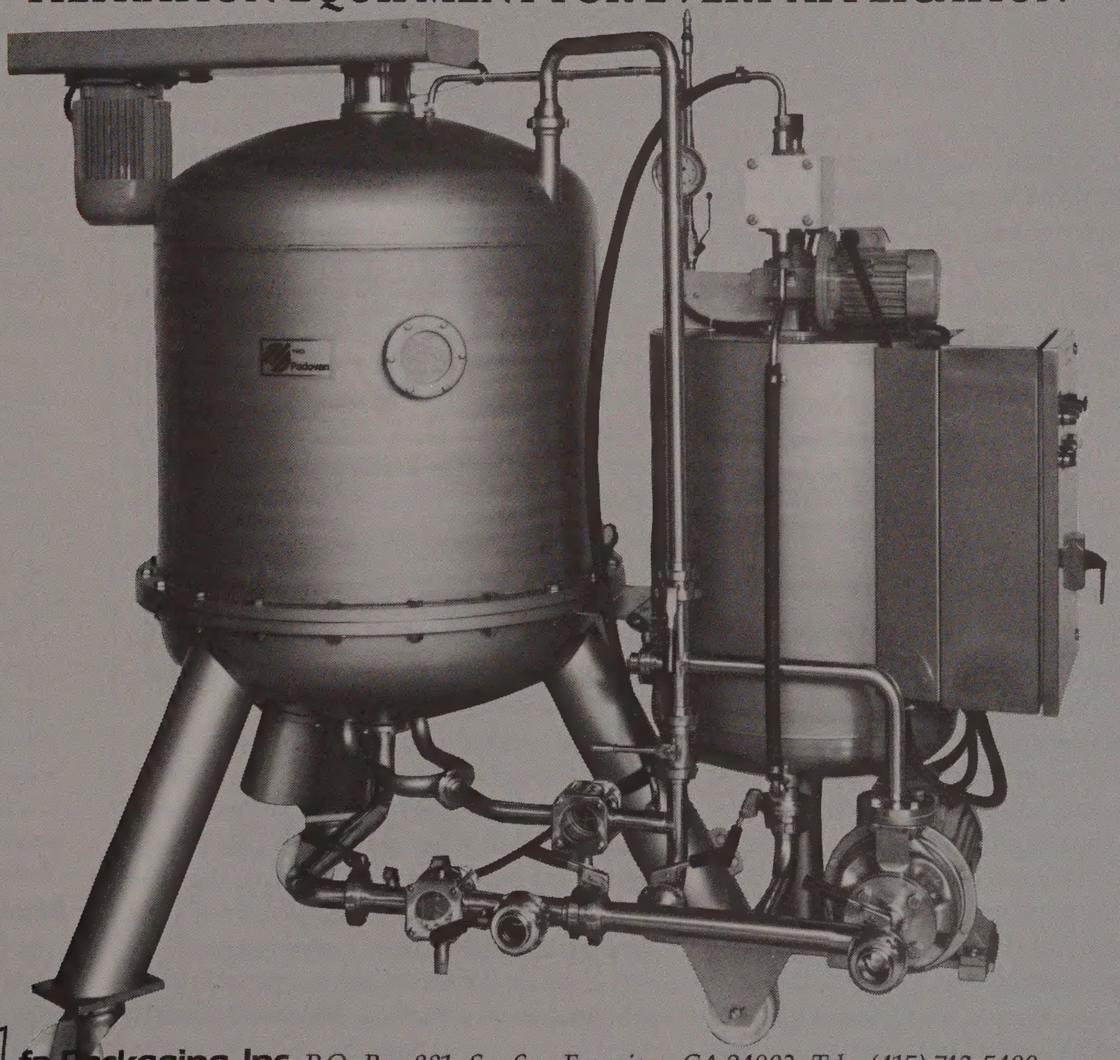

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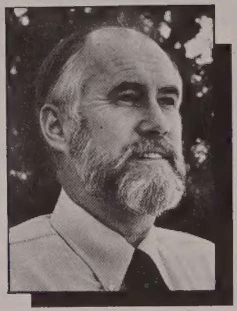


D.R. Storm, Ph.D, P.E.

Sturnis vulgaris; a starling episode

Late in November 1990 I was treated to a spectacular sight in the Carneros region of California during what appeared to be a starling migration, convention, reproductive ritual, or all of the above. The brown clay soils of a recently planted vineyard on Codorniu's property contrasted starkly with the mass of black birds. They would land one minute and the next, be airborne the next, in a chirping, flying cloud.

Even the most ardent and qualified Audubon Society bird observer would have had difficulty estimating the number of birds. Using a conservative shoulder-to-shoulder density of three birds per square foot, a mega-bird count of about 1,600,000 resulted. Approximately 10 to 12 acres of vine rows, with drip hoses and their tie wires, in the occupied zone sagged dangerously from the unplanned bird loading.

Carrying this observation forward, if every Napa-based starling consumed one bunch of grapes per season, the vineyard production mortality could be as much as 800 tons and at Napa Valley fighting varietal prices, the potential for a high, six-figure potential economic loss from these feathered expatriates from Europe is not hard to imagine.

Starlings only have a grape food preference during harvest; they subsist on a carnivorous diet of insects and grubs the rest of the year. As they say in photo-journalistic circles, my photo did not do the event justice — you had to be there!

[For further reading about this winged grape harvester check references at end of this column.]

Wisconsin mound systems;

first choice or system of last resort

Wisconsin mounds have been referenced in previous **PWV** reports as an alternative to conventional septic tank and leachfield systems where poor or shallow soils and/or high groundwater exist. They were originally developed to cope with shallow soil mantles and the super-pervious glacial tills of the U.S. North Central states. The mound system seems to have found a permanent niche in small scale, alternative wastewater disposal technology.[1,5]

What's a mound? When is it appropriate?

Soil absorption systems for primary effluent disposal are doomed to failure if the soil characteristics tend to cluster around either extreme of excess **perviousness** or excess **imperviousness**. In excess perviousness, effluent is not cleansed by physical filtering through a well-graded particle size matrix nor do the larger grain sizes support a good substrate of microbiological flora capable of trapping and metabolizing the entrained waste constituents. Excess imperviousness reflects the soils' inability to transmit waste effluent to successively lower regions in the soil profile.

Under what circumstances does it perform well?

As shown in Fig. 1, a conventional septic tank is required upstream of the mound to remove **settleable solids** by natural sedimentation. Domestic waste has about 60 to 70% settleable solids and BOD (biochemical oxygen demand) which can be removed in the two-compartment septic tank given proper detention time.

Winery process wastewater, on the other hand, contains a very high percentage of **dissolved solids**, and does not readily give up its suspended solids and BOD in a conventional septic tank.

If there is carryover of suspended solids to the mound, the potential for eventually clogging the 'designer soil' is quite high. To help guarantee success with mound systems for process wastewater, the hydraulic and solids loading that accompany the crush cycle would have to be modified by judicious design of the system: use of settling-aids; equalizing storage to reduce high rates of waste discharge; and/or pretreatment by a mixed-media or intermittent sand filter with an automatic backwash feature.

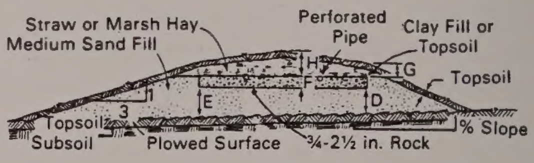
Some winery mound designs have included **dual mounds** that can be alternatively charged and rested in the same manner that dual, conventional leachfields are constructed. This prolongs the design infiltration rate in a less than ideal soil by alternate drying and wetting.

A third soil profile limitation would be shallowness of the soil. Most soil absorption system construction regulations require that a minimum soil depth of 5 feet prevail under the bottom of the leachline trench. Additionally, seasonal groundwater levels cannot exceed an elevation of 5 feet below the bottom of the trench.

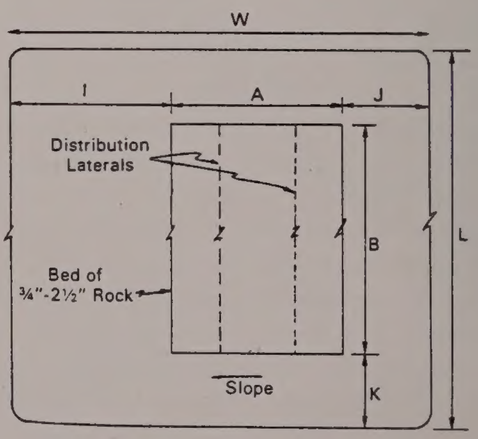
Thus, the mound, with its artificially created, near-perfect soil profile, is an adequate substitute for a number of potential winery applications.

A typical mound geometry and effluent distribution system are shown in Fig. 1.

Figure 1



(A) Cross Section



(B) Plan View

Other mound features

As Fig. 1 suggests, a mound system for a winery also includes a long-term commitment to maintenance of an influent charge pump. This pump is necessary to perform the periodic charging of the perforated small diameter pipe in the effluent distribution network inside the mound body.

The charge pump is a critical system component, so it is a mandatory design detail that some sort of alarm system must be incorporated into the design. The simplest alarm is an audio-visual pairing of a warning light and a horn or bell to indicate pump malfunction. In addition to these alarm modes, a more sophisticated system would have a remote signal sent to an annunciator panel where pump status could be observed.

To assist in reducing the hydraulic load on the underlying soil body, a perennial grass cover crop is usually specified for the shell of the mound. The evapotranspiration afforded by the growing grass can prevent saturation of the mound and water logging of the soils near the toe of the mound fill.

For wineries with limited space, where the mound can't be situated out-of-sight, a landscape architect can integrate the mound into an eye-pleasing blend of plant materials and topographic interest afforded by the mound shapes.

The capital cost for a mound system can be 50 to 100% greater than a conventional leachfield system. It is likely that the water pollution agency in your particular area will follow standard mound design guidelines. These guidelines may include the need for a limited number of monitoring wells that can be sampled periodically to record performance and compliance.[1]

Most important is a device to record the volume of effluent that passes into the mound for disposal, to verify design assumptions and to assist in analyzing performance. Flow meters of the totalizing type are quite expensive, particularly where a non-flow obstructing type is specified (ultrasonic or magnetic field).

For a mound, the ideal device is a 'dose counter,'[3] made for just such an installation. The doses are simply multiplied by the pre-set volume in the pump sump, and the total mound charge for a given period can be calculated. These data are of special importance in sanitary waste installations, where peaking loads from unexpected tasting room activity or whose special function visitor loads can exceed, for short periods, the design loading for the mound.

When only a mound will work

Get the services of a competent designer who can demonstrate design experience and operational success with the systems.

Carefully explore the downside of mound system peformance for winery process wastewater disposal.

Learn from the local wastewater regulatory body which wineries in your area have operating mound systems (both good and problem systems) and, if possible, make arrangements to see them. ■

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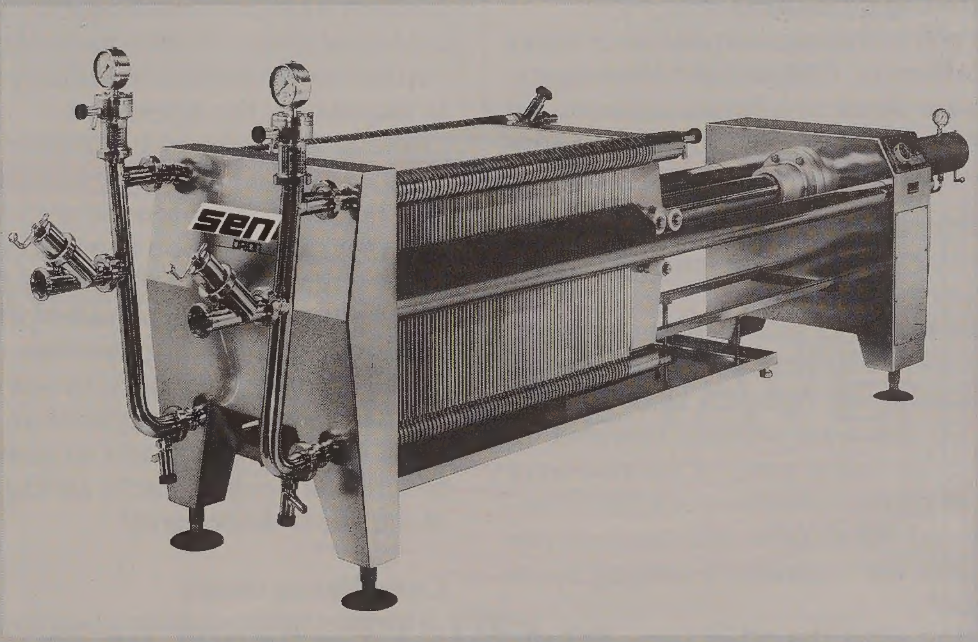

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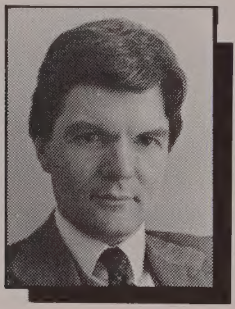

R. Corbin Houchins

Labor contract preface; notes on regulatory reform

This month a brief overview of labor contracting issues and thoughts on red tape reduction, prompted by 1990 revisions to the federal wine regulations.

Contracting for services

We will look at agricultural labor issues in California, Oregon, and Washington in more detail in a future column, but here are some general comments relative to service contracts.

Clarity of objectives

What, exactly, are the business objectives of the contract?

To be sure, your goal is grapes harvested properly and on time, but what promises are you buying from the labor contractor? Do you want workers rounded up and delivered to you, or do you want lugs of grapes picked to particular specifications? What real-world result do you see from the contractor's earning his or her fee?

Stating what the other party actually promises is the heart of any services agreement. Some contracts describe each duty in detail, some say that the contractor will "do all things necessary" to bring about a stated result. In either case, the wording will be significant and merits careful attention.

Funding the promise

Assuming the parties have written down exactly what the contractor promises to do, what makes you believe that you will get what you were promised?

Having a well-drafted contract is certainly helpful, but a document that contains only an agreement to do something within a narrow time frame is basically a device for turning a broken promise into a judgment for damages. What good a judgment will do you depends upon how the obligation is funded. Absent other arrangements, the promise is funded by whatever assets the party who signs on the dotted line may have when the time for enforcement comes. It may not be amiss to mention at this point that bankruptcy law has become a significantly larger part of most business lawyers' practices recently.

How important is performance by the contractor? What is your back-up if the contractor defaults? You must know the extent of the downside from nonperformance in order to gauge the importance of negotiating something beyond a bare promise.

In addition to knowing what the potential loss is, you will want to estimate the degree of risk that it will occur. After putting your own experience with the contractor, investigation through governmental and private sources, references from other clients, direct enquiry into the contractor's financial condition, *etc.*, alongside your ability to withstand the loss, you can assign priority to funding issues in negotiating the agreement.

Among the methods for funding a promise are guarantees and performance bonds (not to be confused with bonds covering the obligation to pay workers). If the contractor is a corporation, do the principals personally guarantee performance? Going beyond guarantees of the principals is generally going to cost someone a fee, such as a bond premium. Who pays? What company acts as guarantor or surety, and what, exactly, are the terms of the guaranty or bond?

Compliance issues

The threshold question for governmental compliance is: Whose employees are they?

Among the usual purposes of a labor contract, apart from buying expertise in finding and supervising workers, is insulation from penalties for noncompliance with labor, tax and immigration laws. What assurance do you have that the government will not come after you if the contractor defaults? Who is ultimately responsible for making sure the workers are 'legals,' that they are being paid in accordance with law and that payroll taxes and statutory benefits are properly handled by the employer? Even if you have no legal responsibility, what would be the effect of interruption of service if immigration or other legal problems arise during picking?

About all that can be said here and now is that the answers to the above questions cannot be determined by recitals in the agreement. Your legal advisor will have to review or draw up the labor contract with an eye on both federal and state law.

Regulation of production

Changes in 1990 to Title 27 of the Code of Federal Regulations affecting wine production prompt a word about the federal regulatory process.

If you looked at Treasury Decision ATF-299 (notice numbers 543 & 584), you saw a summary of the 11-year history of efforts to delete some patently unnecessary cellar regulations. Perhaps the process was extended somewhat by contemporaneous litigation involving varietal labeling regulations and by sporadic interest in ingredient labeling, but much of the time was devoted to ascertaining what 'the industry' wanted and to carrying out procedures for public comment.

Several suggestions from the more than 80 people who submitted written comments were adopted. The Bureau of Alcohol, Tobacco, & Firearms (BATF) does listen to requests for relief from red tape, and not only when there is a wholesale revision in the works. Wineries should initiate rule change proposals whenever they find bureaucratic requirements onerous.

The net effect of the last revision is substantial or not, depending on whether you consider fairly detailed governmental regulation of winemaking normal or aberrational. To those for whom Title 27 is simply part of the environment, like the natural laws of biochemistry, eliminating several pages of stuff you had to take into account is significant. To those for whom anything not known to Louis Pasteur and Adam Smith is excrescent, the improvement is pitifully small.[1]

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[1] In abridged recap: Updating definitions (*e.g.*, gm./L. in place of ppt); deleting such minutiae as office facilities specifications; simplifying the documents required to establish or expand a winery; increasing automatic tax bond deferral coverage to $500; clarification of amelioration rules and the interplay of amelioration with acid correction; elimination of formula and process approval for sparkling wines; clarification of labeling rules for low-alcohol wines; a new Subpart L, pulling together rules on authorized treatments and materials; simplification of some reporting requirements in Subpart O; recodification for easier reference; and official deletion of obsolete rulings.

To put the changes in context, consider the facts that products intended for human consumption have long been regulated by governments, and that if all the BATF and state wine regulations went away tomorrow, you would still be dealing with the Food & Drug Administration and various state agricultural product and public safety agencies.

Historically, regulated foods fall into two categories, those for which there is a standard of identity and those which are made up of identified ingredients. The fact that wine is in the former category under existing laws brings us relative freedom from ingredient labeling laws, relative lack of scrutiny from the agencies that poke around packing houses, dairies, *etc.*, and a measure of protection from anti-drug hysteria.

Calling a product 'wine' or 'ice cream' or by some other generic name rather than a lengthy statement of components is possible because the meaning of the term is written into law. Part 24 of Title 27, taken as a whole, defines the product. As I see it, any program of regulatory reform, such as moving table wine from the BATF to the Dept. of Agriculture better to shield it from anti-alcohol measures, should attempt to preserve the results that evolutionary rule-making has achieved so far, lest a new agency find itself in a free-for-all among competing interests. ■

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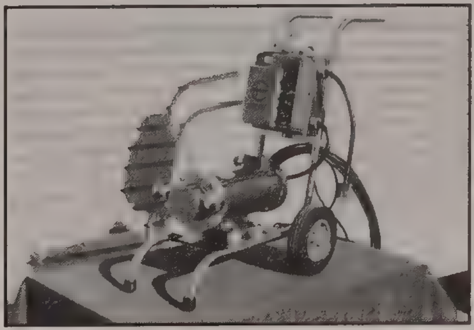

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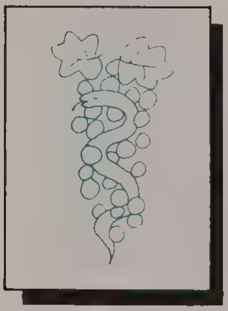

Wells Shoemaker, MD

Lead me not into temptation

Besieged by prohibitionists and harassed by environmentalists, all of whom occasionally exaggerate health facts, the wine industry doesn't crave any annoying revelations from one of its insiders.

The **PWV** *Jan/Feb'91 'Wine & Health' column explored the ancient history of lead-contaminated wines betraying the Roman aristocracy. A secondary note addressed the modern concern about minute quantities of lead salts accumulating underneath lead alloy foils. In this column, we will view another contemporary issue about lead and wine.*

Lead, when added to molten quartz, renders an elegant, lustrous glass with a distinctively heavy feel. Wine lovers have often reserved their expensive lead crystal glassware for special occasions, using ordinary glass for their everyday use.

In January 1991, the ***Lancet*** medical journal dropped another weight upon our weary toes: Lead crystal glassware leaches lead into acidic liquids such as wine.

The ability of acidic juices to extract lead from certain pottery glazes has been known for some time, but the bioavailability of lead in glass was unsuspected.

Drs. Graziano and Blum found that wine stored in a lead crystal table glass picked up measurable lead over the space of hours. Beverages stored for weeks to months in lead crystal decanters accumulated lead levels that could be overtly toxic. Fortunately, beverages likely to be stored for long intervals are customarily served by the small glass and are rarely consumed in one setting by one person.

The amount of lead removed from lead crystal glass is influenced by several factors (lead oxide percentage, pH of the liquid, and temperature) but **duration of contact** is certainly the most important. Recommendations:

1. Avoid any long-term storage of plain or fortified wine (or spirits) in lead crystal decanters. They make lovely flower vases.
2. If you use lead crystal glasses for wine with a meal, they should be emptied within an hour. Ideally, serve wine in plain glass and use the beautiful, heavy crystal glasses for neutral pH ice water — it's becoming more scarce than wine, anyway.
3. Don't use lead crystal in any fashion for children. ■

Dr. Shoemaker vastly prefers citing good news about wine and health, but this column holds a direct preventive message for winemakers and their best customers.

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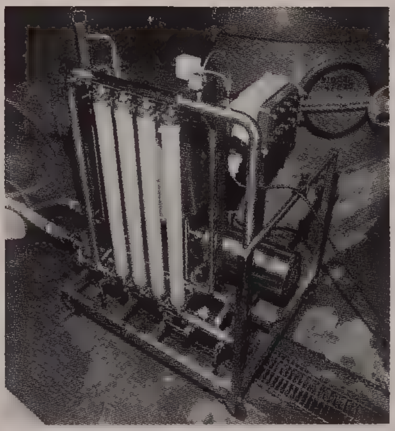

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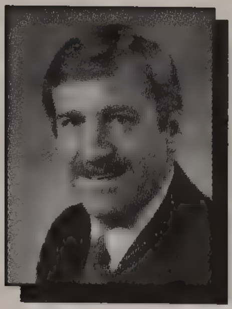

James Tresize

Shaping a new political landscape

James Tresize is President of the New York Wine & Grape Foundation; Vice-President of the American Wine Alliance for Research & Education Executive Committee; National Wine Coalition

In October 1990, a major sporting event riveted the nation's attention on the Midwest and the Far West. The seven-game baseball series began with no doubt about which was the stronger team — the Far West clearly dominated with money and muscles and media, and had experience being at the top. The only real question was: Would it be a sweep — a four-game embarrassment?

Indeed it was. But it was an upside-down sweep, a blowout in reverse of everybody's expectations — because it was the Cincinnati Reds who embarrassed the Oakland A's in the 1990 World Series.

A year earlier, the World Series pitted the Far West against the Far West — Oakland against San Francisco, the Battle of San Francisco Bay — symbolic of California's dominance in sport as in much else these days. Obviously, California couldn't possibly lose . . . until a major earthquake severed the TV cables, damaged the cities, and spoiled the Series.

In 1990 in Washington, DC, a major political event called budget negotiations riveted our industry's attention on deficits, sin taxes, and perceptions. What emerged was a combination of the two World Series — an upset and an earthquake — that has begun shaping a new political landscape for the grape and wine industry in the United States.

California (the big guys) took a beating, while the unknown underdogs from much smaller states scored a stunning victory. But overshadowing that upset was a major political earthquake which I hope will awaken our industry to the realities of the 1990s.

Because whether we stay buried in the rubble or emerge like a phoenix from the ashes depends entirely on us — on what we have learned, on how smart we have become, and especially on how unified we will be.

I believe that our ability to act as a unified industry during the coming decade will shape the political landscape for wine in the 21st century. I'd like to illustrate with four major points:

- The events in Washington in 1990 are cause for both concern and optimism.
- 1990 was just the tip of the iceberg, the first ring of the alarm clock, in terms of the challenges we will face in the coming years.
- Our industry has grown from being an adorable infant into an awkward adolescent struggling hard to grow up — which we need to do in a hurry.
- Finally, we have an unprecedented opportunity to create a process that can shape the future the way we want it.

Whether we take that step will determine whether the year 2,000 will be a dream — or a nightmare.

The good, the bad, the ugly

Both good news and bad emerged from Washington last fall. First the good news: Our industry beat the proposed increase in the Federal Occupational Tax dreamed up by the White House brain trust. You remember, they wanted to increase the annual license fee by a mere 3,800%, from $500 to $19,000.

Apparently they did not realize that the vast majority of the 1,400 wineries in 46 states are small family farms that would immediately be put out of business by such an unfair, unwise, and unconscionable tax increase.

But finally someone in Washington rubbed a couple of brain cells together and realized that this measure might be counterproductive: It would wipe out a promising agricultural industry, decrease the tourism it generates, eliminate thousands of jobs, devastate a complex supplier network, and evaporate the source of tax revenues it was going to tap. No taxes, no jobs, no businesses — what a great idea!

Got any others? Sure. Just swallow the propaganda of the liquor dealers and embrace their wonderfully simplistic notion of 'equivalency' — the idea that a drink is a drink is a drink, that wine equals liquor equals beer. Oh, really?

Then why are peace treaties, weddings, and births toasted with champagne instead of Scotch? Why do state dinners feature wine instead of whiskey? Why is vodka served at bars, but wine at the table?

Why all the talk about wine-and-food pairings, but none about food-and-liquor matchups? Why do many hospitals offer patients wine, but not rum? Why did Jesus turn water into wine instead of gin? Because liquor is a drink, and wine is a food. As Robert Mondavi put it, "Wine is liquid food."

But try telling that to the White House after the spirits merchants have paid a visit. What did they want to do to this liquid food? Raise the taxes astronomically, by 2,400%, to begin paying for the leveraged legacy of Reaganomics.

Never mind that wine is an agricultural product, one of the few that receives no Federal subsidies, and the only one that already pays punitive excise taxes. Never mind that wine is a food, most often consumed with other foods, which enhances the quality of life. Never mind that wine accounts for a tiny fraction of DWI (Driving While under Influence of alcohol) incidents, that wine is the beverage of moderation, that wine may even be healthful in moderation if we pay any attention to the history of civilization. Never mind all that: wine contains alcohol, alcohol is sinful, 'sin taxes' are politically easy, so let's tax wine and avoid the real issues.

Well, as it turned out, we got lucky — they only increased excise taxes by a mere 530%. At least we got the increase back down into the three-digit range. And of course the best news of all is that small producers are exempt from any increase at all. So now we can relax, right?

Wrong.

Last year was just the beginning, the first year in a decade of challenge. Certainly let's toast the successes of 1990, to thank the Association of American Vintners for its hard work, to congratulate the National Wine Coalition for jumping into the fray just as it was being born.

A sobering landscape

But now let's take a sobering look at the new political landscape. Reaganomics has come home to roost. The massive federal credit card that the U.S. abused throughout the 1980s has saddled us with an economic crisis of frightening proportions and unpredictable duration.

The excise tax increase was part of a package to close a $500 billion budget gap. Now, after that, they've got a $300 billion budget gap — a new one on top of the old one — and where do you think they're going to look for revenues?

To sin taxes, of course, and especially to businesses that may have escaped harm in 1990 — like the small wine producers. Eliminating the small-producer exemption will be especially tempting when it's taken to court as a possible violation of international trade agreements. Appease our trading partners, save litigation fees, add more revenues — these are not a bad combination of incentives for rethinking the exemption. So, please, don't relax.

The states have huge problems, too. The new federalism has returned to states the authority and responsibility to deal with the nation's toughest problems. It also has taken away the money needed to solve them. So from sea to shining sea, the states are awash in red ink, busted and scrambling for revenues, and looking to politically comfortable solutions like sin taxes to plug the hole in the dike.

Why not? Look at all the logical arguments, the moral justifications. Like, "Wine hasn't been increased in such a long time." (Don't mention that as an agricultural product it shouldn't be taxed in the first place.) Or, "We have to stop DWI." (Absolutely, but already there has been great progress, and wine accounts for less than 5% of DWI incidents.) Or, "Under-age drinking is a serious problem." (True, but how many teenagers are abusing Chardonnay?)

None of this is to deny that wine contains alcohol, that alcohol can be abused, and that this industry has just as much of a responsibility to educate people against abuse as we do toward the proper and full enjoyment of this wonderful product.

But we also must guard against those who seduce the public and politicians with the twisted logic that wine contains alcohol, alcohol is a drug, cocaine is a drug, and therefore Chardonnay equals crack.

Refuting that lie is not only a matter of economic self-interest. More importantly, it's a matter of social responsibility, if we are to have any sense of balance, reason, and truth in this society. ***In vino veritas*** . . . in wine there is truth. And it's about time the truth got a little respect.

Wine takes its lumps

Wine is getting a bad rap in the U.S., and it's only going to get worse. With shrinking government budgets and the horrendous illegal drug problem competing for those disappearing dollars, the traditional anti-alcohol groups are scrambling for money, and churning out sensationalist propaganda to attract it.

Wine is lumped with spirits, largely because the spirits producers want it that way and have the advertising budgets and political influence to keep it that way. Few people in our industry (Robert Mondavi being a notable exception) have had the vision and courage to stand up and say, "Stop! Wait a minute. This is wrong. Let's get the truth out there for a change."

Have you ever stood out in the freezing cold pruning vines? Or worked as a cellar rat in a winery? Have you invested your hard-earned money, your sweat equity, and your ego in a winery? Does this business feed your family?

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If so, doesn't it upset you that politicians want to take the bread off your table by multiplying taxes that already are unwise, unjust, and unwarranted? How can you let people punish the product that accounts for your job, your mortgage, and your dreams? Don't you get at least a little upset at people who are essentially labeling you a drug dealer?

I've dealt with a lot of different regulatory agencies during my career, and I can tell you that the Bureau of Alcohol, Tobacco & Firearms is one of the most reasonable, responsive, and responsible. But the mere fact that our industry is regulated by that agency at all is a throwback to the era of Prohibition, to the bane of bathtub gin, and to the legacy of Al Capone.

Why on earth is wine lumped with tobacco? Where is there a shred of evidence that smoking a few cigarettes each day might be good for your cardiovascular system? Can someone please explain how assault weapons enhance the quality of life?

The political landscape of the 1990s is bleak — a mine-field of social issues darkened by threatening economic clouds on the horizon. Governments need money, and alcohol is an easy target. Wine is guilty by association, and the wine industry has not gotten its act together — yet.

The industry's bright spots

Let's look at our industry's real bright spots — each of you.

Take a look in the mirror. What do you see? What I see is an industry of men and women who love to grow things, to make things, and to make people happy. An industry of honest, hard-working, fun-loving people. An industry of farmers, entrepreneurs, artists, and scientists.

This industry preserves the land, nourishes the spirit, and enhances the quality of life. It is an industry that has just spurted from adorable infancy to awkward adolescence, and now needs to graduate into graceful maturity.

What is an adolescent industry? One that is young and still in search of itself. Let's take a look at how young we really are:

- Today, wine is made in 46 states. In 1970, just 20 years ago, only 22 states had wine producers, less than 1/2 of the current number.
- Today, California has about 700 wineries, up from just 100 a mere 20 years ago.
- Today, the U.S. has about 1,400 wineries, compared with less than 200 just 20 years ago.
- Twice as many wineries were created during the 1980s than during the 1970s — and in the 1970s twice as many wineries were created than had existed during the previous 200 years!

This is explosive growth! Maybe too explosive. I think that helps explain our industry's political immaturity. We're young, energetic, confident, awkward, nervous, unfocused, insecure. We've got to settle down and grow up. We've got to channel all this incredible energy and wild-eyed enthusiasm into areas that will help us grow. To do that, we've got to work together.

But that's not easy, and it doesn't come naturally. Can you think of a group of stranger bedfellows than the people who

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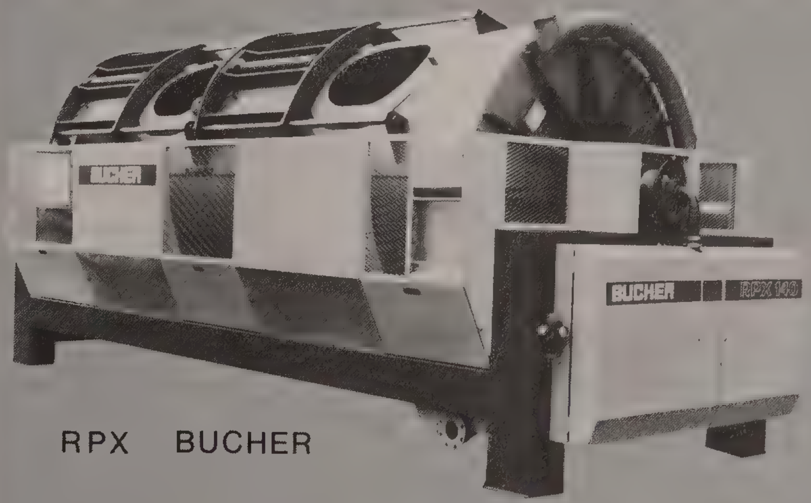
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comprise this industry? Independent farmers, ambitious entrepreneurs, exacting technicians, tempermental artists, opinionated winemakers. What a volatile blend of ornery critters.

But what brings us all together? What elevates us above our parochial concerns, is the love of wine and the pride we take in being part of its creation. With that common focus, our diversity becomes our strength.

Balancing our lopsided industry

Beyond the love of wine and all that mush, the reason we need to work together is simple survival — which is much more likely if we hang together. Let's look at some different numbers:

- California makes 90% of all American wine, and the 45 other states make a combined total of 10%. Isn't that an astounding imbalance?
- Half of the nation's wineries are in California, with the other half in the 45 other states. That's a little more in balance, but still pretty lopsided.
- California has two U.S. senators; the other wine states have a total of 90. In this instance, the gross imbalance is not on California's side.

What's the bottom line? We in the 45 other states should all thank and praise California, and especially Ernest and Julio Gallo, for Americanizing wine as a beverage and as an industry. We should also recognize, without inferiority, jealousy, or rancor, that California will continue to be the dominant wine producer in this country for the foreseeable future.

California should be big enough to acknowledge that it can no longer control the politics of wine in the U.S., because there's a large group of adolescent states feeling its oats and growing up in a hurry.

There is no doubt that Oregon initiated and protected the small producer exemption last fall, or that it was the major players from California, particularly the Wine Institute, that decreased the ultimate level of excise tax increase last year.

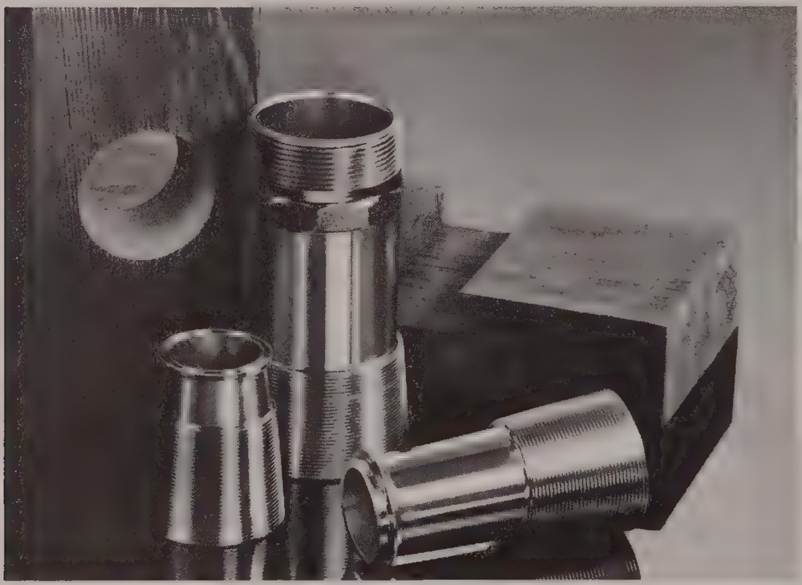
I love California, but the California wine industry has been plagued by a serious problem which threatens their industry, and the rest of us as well. It's not phylloxera in the vineyards, and it's not any flaw in the wines. It's internecine warfare among the industry leaders — the battle of bionic egos, which would be funny if it weren't so tragic.

At the January 1990 Wine Industry Technical Symposium, I told a large audience of Californians that they were acting like a bunch of adolescents and ought to grow up. I said they were fighting against each other instead of with one another against common foes, and that despite all their success and sophistication, they were politically immature and light years behind the New York industry in terms of tapping into the power of cooperation.

I also emphasized that we, as a national industry, need to cooperate, consolidate, and unify on a national level. In short, we need a national organization.

New national movement

That has begun to happen, not because I said it should, but because more people are realizing it must happen if we are to survive and maybe even prosper some day. The California Wine Institute planted seed money for the National Wine Coalition, whose Executive Director, John



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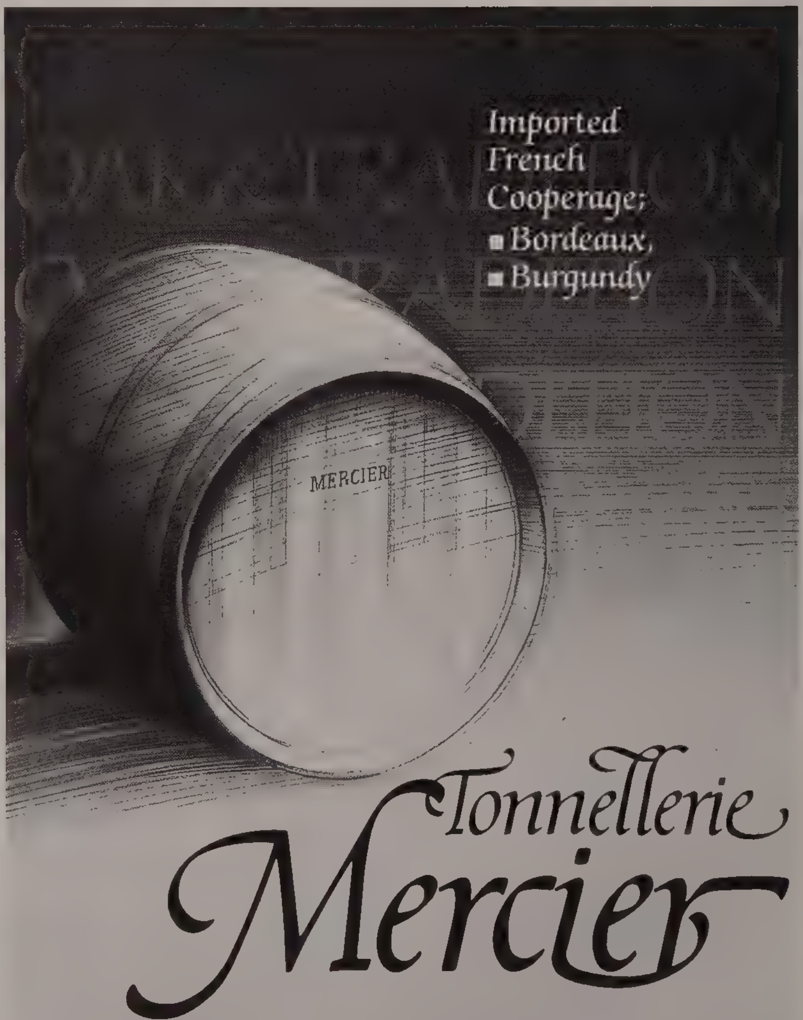

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In 1990 Volpe worked closely with another top-flight professional, Bob Kalik, the Washington counsel for the Association of American Vintners (AAV). A significant number of California wineries have now joined AAV.

I think there is a consensus that we need to consolidate the different organizations and their efforts without sacrificing the support and talent that makes them so effective. That won't happen overnight, but it will happen, because it has to.

But even that is not enough. Ultimately, and most importantly, we need to unify. That doesn't mean we should ignore disagreement, discourage diversity, or stifle initiative — in fact, we should do just the opposite. But it also means that we must focus on a common objective, and let that objective drive our common efforts.

I suggest that, for the next decade, we focus our collective energies on one broad objective:

To create a business, political, social, and educational climate that will ensure the winegrowing industry's ability to survive, prosper, and contribute to the American economic system and quality of life in the 21st century.

More specifically, we ought to:

- Eliminate the threat of any further special taxes on the wine industry.
- Roll back current federal and state excise taxes.
- Introduce incentives for wine industry growth nationwide.
- Double American wine consumption by the year 2000, and triple the dollar value of sales.
- Make the wine industry a model of economic efficiency, environmental awareness, and social responsibility.
- Stimulate investment, jobs, tourism, and economic growth.
- Enhance the quality of life in this country.

A success story

These goals are attainable. One state has deliberately and effectively improved the business climate for its wine industry. This state has had a grape and wine industry for well over a century. But this industry was going down the tubes just six years ago, because of antiquated regulations, counter-productive laws, and benign neglect.

Vineyards were being foreclosed, farm equipment auctioned, and wineries closed. Orders for corks, bottles, and labels were cancelled. Advertising disappeared. So did tourists, who didn't like the look of abandoned vineyards or the inhospitable feel of boarded-up wineries.

The ripples kept spreading, through more levels of the economy than anyone realized were touched by this tiny industry — tractors, plows, tires, fuel, wood, wire, clothing, presses, tanks, barrels, bottles, labels, corks, boxes, paper, computers, telephones, trucks, people. People were the hardest hit, losing their jobs, pride, and hope.

The grape growers of this state, joined by some wineries and suppliers, drove hundreds of miles to the capitol and talked with the governor, and with legislators in both houses on both sides of the aisle. Those public officials, Democrat and Republican, listened attentively, set aside partisan politics, and forged a comprehensive package of market-oriented

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legislation which improved the business climate for this industry in this state.

The results? A fundamental and dramatic economic turn-around. Decline was replaced by growth. Within two years, the prices paid for grapes doubled — and have gone up every year since then. Gross sales of grapes have reached record levels. The number of wineries grew by 50% in just five years, over an already large base.

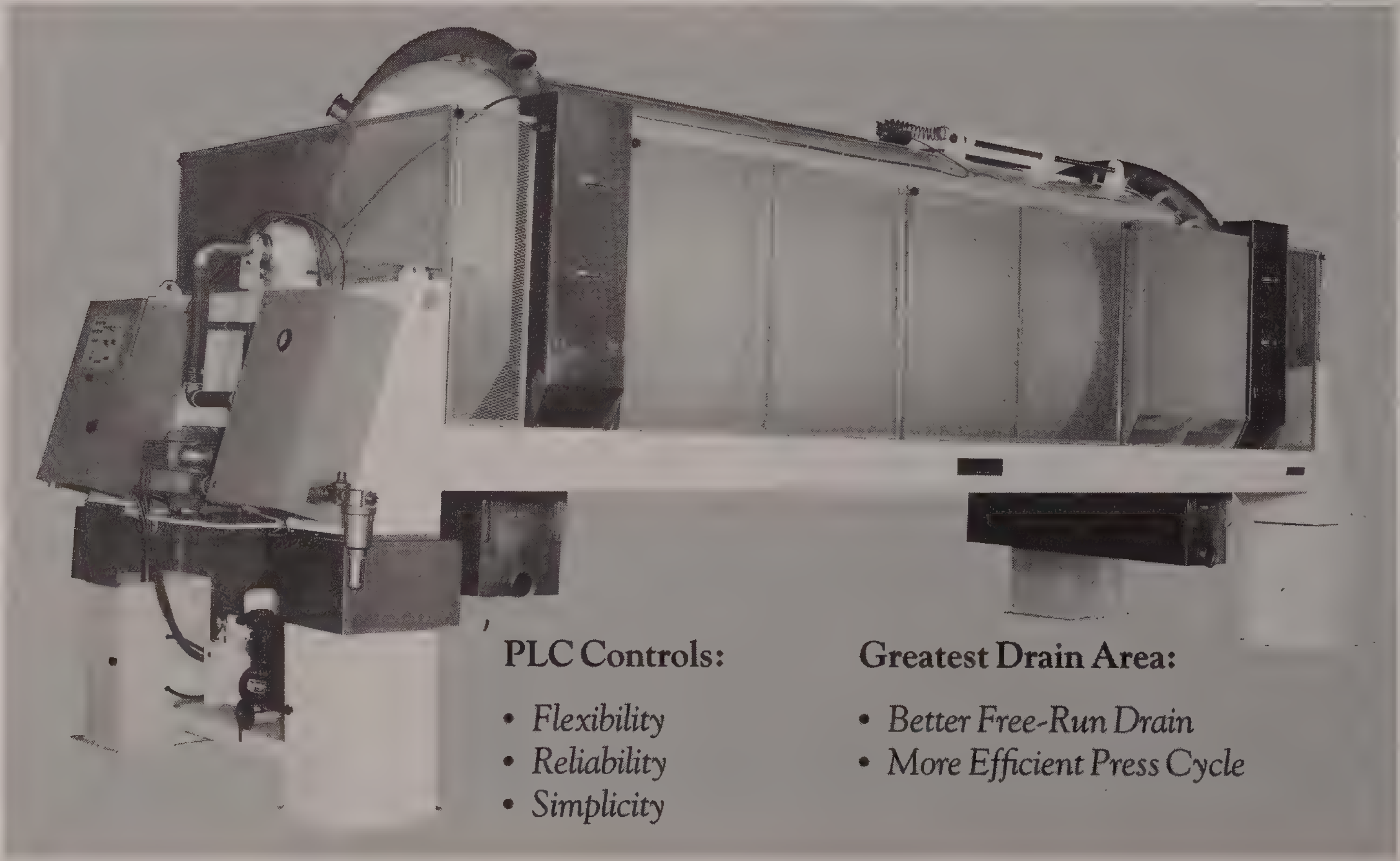
Wine sales have increased during a period of national decline. Wine country tourism has soared, which means direct sales and maximum profits for the wineries, more gasoline sales and hotel rooms and restaurant meals for the regions, which means more jobs and taxes for the state.

This industry is now contributing more than ever to the state economy because the state created the right climate for letting that happen. No, the state didn't get into the wine business, but rather, got out of it through market-oriented public policy that lets business do business.

Does this sound too good to be true? The state is New York. The real credit for this success story goes to the grape growers and winery owners in our industry who saw the problem, suggested a solution, and then overcame their historical suspicion and antagonism to unite together to make it happen. ***Unity!***

Credit goes to the many legislators who sponsored the bills or supported the solution even though they didn't have a grape grower or winery in their district (like in Brooklyn or Queens) and often had other constituents who would oppose it. Credit especially goes to Governor Mario Cuomo, who had the vision to initiate this controversial legislation and get it enacted into law.

Why did Cuomo do it? Certainly it didn't hurt that he and his family, through their families and their heritage, have wine on their table and understand its proper



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place there with other foods.

But Cuomo is also a man whose appreciation of wine extends well beyond aroma, bouquet and taste. Because he understands that in every bottle of wine there are farms and families, tractors and trellises, jobs and tourists — and the intense pride that makes families put their name on the label. Sure, citizen Cuomo wants the bottle of wine on his table — but Governor Cuomo wants the business of wine in his State.

Imagine if every other governor felt the same way, if every state wanted to cultivate this agricultural industry, if the White House and Congress could understand how much this industry could contribute to the economy and the quality of life.

Can that happen? Yes, but only if we change the perception of wine in the U.S. Because perception is reality, and right now the perception of wine is a social problem rather than an economic opportunity.

How can we change the perception of wine? Through education. We need to educate many different groups — ourselves first, then our colleagues in the trade, consumers, and suppliers. We especially need to educate the people in this country who shape our business climate with their laws — the White House, Congress, and state legislatures.

I propose that the best way to do that is through a new network called WINES — the Wine Industry National Education System.

What is WINES?

WINES is the way to unify a fragmented industry, and the way for the wine industry to finally get results and respect in the public arena.

WINES is also a way to simplify the confusing decision about where wineries should write their checks for national action — to AWARE, the National Wine Coalition, the Association of American Vintners, or perhaps other organizations which may have noble purposes and dedicated people but which end up confusing the issue.

There are too many organizations competing for too few dollars, leaving the wine industry fighting with itself, dangerously vulnerable to unwarranted attacks by neo-prohibitionists and, worst of all, dissipating the power of unity.

WINES is a superfund, a 'United Way' for the wine industry where all funds for organized national activity are channeled into one organization. Its broad-based Board of Directors allocates the money — to lobbying, public relations, health and social issues, industry communications — according to current needs, available resources, and past performance.

The Wine Institute of California cannot be a true national organization, and the National Wine Coalition is perceived by many to be too close to the Wine Institute, despite the superb performance of Exective Director John Volpe.

The Association of American Vintners, formerly an 'other states' organization, has recently gained significant membership from California, but it's unlikely the 'major' wineries will sign up with the 'mavericks.' And AWARE, by its charter is, in effect, prevented from tackling many of the most pressing issues and areas.

None of these worthwhile organizations is the one organization we need. So the clutter continues, the stalemate stagnates, and the wine industry wonders why it is withering away.

We need one organization, one purpose, one voice. WINES is it. ■

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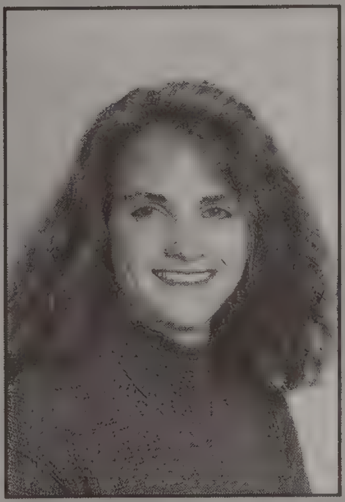
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SMART Conference report

Left to right: Don Neel, Editor and Publisher of Practical Winery & Vineyard; Jim Allen, General sales manager, Southern Wine & Spirits; Dan Wilson, President, Innovative Wine Marketing, Ron Larson, Managing Partner, Broad, Schulz, Larson & Wineberg; Bill Leigon, Managing partner, The Wine Trust

"If you want to have a recession," said retailer Ron Loutherback, "you will have to start without me." He had a strong message for the 126 distributors, retail merchants, and winery executives and salespeople who attended the SMART (Selling, Marketing, and Retailing Together) Conference held in February in Long Beach, CA.

Listen to your customers and contribute your best ideas both up and down the distribution channels, suggested Loutherback. "If you listen well," he added, "your customer will tell you what he wants to buy; from that point, the sale is easy."

Loutherback's Wine Club in Santa Ana, CA, experienced 41% growth in 1990 and he expects another dramatic increase this year. He encouraged distributors to invite customers and suppliers to periodic planning meetings as he does at his store.

Listening is one way to *acquire* information, but wineries are going to have to work harder to *supply* information. According to Cindy Deutsch, Director of Marketing Research at Robert Mondavi Winery, buyers demand the vendor to be extremely well-informed, and this includes thorough knowledge of sales data based on scanner information.

The chain buyer now compares the wine sales presentation to the high-budget presentations made by big food vendors. Buyers are growing intolerant of salespeople who know less than they do about the performance of products in their stores. This widens the gap between modern, state-of-the-art presentations and the old-fashioned 'deal sheet' presentation, and puts smaller operators at a disadvantage.

Small and large operators alike must learn how to compete successfully in the 1990s. Jim Crupi, SMART keynote speaker and President of Strategic Leadership Solutions, defined the trends that affect the ways we must do business in the new decade.

Quality, he said, was the watchword of the 1980s. Now, quality is taken for granted, and value is the goal. In addition, the sheer volume of information people receive creates an overload. The common reaction is to ignore information about unknown products and stay with brand-name merchandise.

Crupi stressed team orientation for modern employees. Using a sports simile, he said that old-style organizations were like football teams; only certain individuals could score a goal, and the rest were support players. Modern companies must be like basketball teams: Get the ball to the open player and let that person make the basket. This creates the need for flat and flexible organizational structures based on leadership, not authority based on position or seniority.

Crupi outlined the economic softness of San Francisco, CA, a city he compared to Venice, Italy. The economic power has moved from San Francisco to San Jose, he declared. Jobs follow people, thus reversing the familiar patterns of the past, he added. Employers must acknowledge these changes if they are to remain competitive, according to Crupi.

One retailer who has remained competitive is David Breitstein, owner/operator of the Duke of Bourbon retail shop specializing in fine wines and spirits in Canoga Park, CA. He spoke about selling premium wine:

Profits are usually equated to a percentage of profit on sell — a full-service retailer needs to make 30% to 35% average on sell. This will allow: 1) keeping good inventories; 2) employing knowledgable people and giving proper benefits; 3) prompt payment of overhead; 4) prompt payment for wine; 5) maintenance of the proper environment for fine wine; 6) ability to age wine for future resale; 7) return of investment.

How many young people own fine wine shops today? I don't know of very many. In fact, I don't know of one new fine wine shop that has opened in the Los Angeles area in the last few years. If proper profits are assured, we will interest new 'young blood.'

What can a winery, wholesaler, or sales representative do for an independent retailer to help assure stable profits?

When a winery produces a product, who do they plan to sell it to? We need a complete understanding of the target customer and who should sell that product (the independent retailer, a chain, or winery-direct).

Here is what the winery should keep in mind:

1) Produce wine that has consumer interest and demand.

2) On limited wines, allocate enough product from the 'get-go.' Don't hold back. It is hard to re-start interest three to six months after an initial release.

3) Don't have complex sales programs where prices change every month. The 'push-pull' is not for us.

4) Stay away from 'adversarial pricing.

The latest trend to have special lower restaurant-only pricing is not only dangerous but very unfair. If a retailer finds out, he or she might drop your product. If a retailer is able to buy at the special restaurant price, the retail price might be lowered so much that it will upset the entire marketplace.

Discounts of 15% or more from the front line allow discount clubs or clearinghouses to sell below cost.

Why should high-end products have five-case, 10-case, 25-case, 100-case, 200-case programs? — especially when the traditional outlets usually buy one to five cases maximum at one time.

All of this can erode profits by forcing your product into 'price wars.'

5) Employ educated sales representatives who can help the account and make him feel good about doing business with your winery.

6) Let us know what your sales programs are going to be for the next six to 12 months so we too can plan.

7) There is nothing wrong with giving a retailer a franchise on your product. I feel it is important for you to create a teammate relationship with the retailer to help build your brand and serve consumers.

8) Look hard at your minimum requirements for free delivery. Don't have a 3-case minimum and then give 5% on 5-cases or 10% on 10-cases. If you don't

have to discount, why not pick up the delivery cost from case one? Perhaps a particular store only needs one case.

9) There are many wonderful brands that fine shops and restaurants want to carry. However, in many instances, one has to buy five to 10 cases of a product to get it at a competitive wholesale price.

SELLING Premium Wines to chain stores

Jim Allen, Vice-President, General Sales Manager of Southern Wine & Spirits in Cerritos, CA discussed selling premium wines to chain stores:

It is difficult to do business with any company if you don't understand their goals and mentality. The most successful chain account executive fully understands the needs and direction of the chain he is selling to. The successful salesperson is aware of the current fiscal and monetary situation which changes constantly, according to leverage buy-outs, inventory position, and shifts in management.

The top chain account salesperson constinously provides information to the buyer. Some of the most important information the salesperson can supply is shelf management and scan track data information.

In today's competitive environment, wholesalers must provide salespeople with the best computerized information. A number of systems are available, such as Apollo, Acu-space, DPP, and Spaceman. These programs provide real-life simulation of bottles properly placed on the shelf for maximum profit return.

Using this information, a salesperson can properly present a plan-o-gram geared toward profitability. The plan-o-gram would dictate the shelf position of higher profit items, namely 750mL varietal premium wines.

There is another computer program that can supply all-important demographic information, based on current census data. This gives wholesalers an opportunity to plot sales by zip code and also suggest pricing and promotions using scan data, per capita income, household income, age, race, etc.

Wholesalers must make sure their salespeople are thoroughly familiar with these computer programs, and that they are able to make proper and sensible presentations geared to the individual needs of particular chains.

Wineries' link to wholesalers

There are a few things wholesalers must have from wineries in order to properly serve the accounts. The most important is timely pricing information.

Many suppliers provide pricing and programming for the entire year, which is wonderful. Information for six months is satisfactory. But anything less than 120 days retards our ability to give timely information to buyers.

It's a fact that fewer than 10% to 12% of shoppers actually walk into the wine department of a grocery store. It behooves all of us to develop better ideas about cross-merchandising.

In the computer age, retailers know what is selling. With greater demand on profits, they will have less space and less patience to offer slow-moving brands.

Because American consumers are increasingly concerned about disposable income and savings, they will gravitate toward wines that consistently deliver more value for the dollar.

I believe the pressure on jug wine sales definitely will continue as retailers discover they offer less profit for shelf space that they occupy. They will also be more effected by increases in federal and state taxes as a percentage of total cost.

The premium wine category delivers substantial quality at favorable pricing. Marketing to new ethnic Americans, as they become more affluent, will be more important, and we must appeal to these groups.

Retailers will depend more on distributors to help pull products through the system. Merchandising, merchandising programs, and adequate manpower are very important. Through many years of experimentation, it has been proven that a merchandiser can properly manage 10 or 12 stores in a geographic area. More than 10 or 12 makes it difficult to gain rapport and to sell individual programs.

In summary, it is now possible to present a chain buyer with a realistic profit picture based on hard scanning and demographic information, thus encouraging the buyer to sell premium varietal wines. ■

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Integrated viticulture in eastern Switzerland

By Dr. Pierre Basler, Dr. E.F. Boller, Dr. Werner Koblet
Swiss Federal Research Station
Wadenswil, Switzerland
compiled by Dr. Paul W. Skinner
Vineyard Investigations, Winters, CA

The continued use of agricultural chemicals (insecticides, fungicides, herbicides, and fertilizers) has become an important political, social, and environmental issue in western Europe during the past 20 years.

Due to the close proximity of population centers and water supplies to agricultural lands, controls on the use of agricultural chemicals have been mandated. In addition, a growing consumer market is demanding 'organic' food products, including wines.

As a result, agricultural systems which depend less on chemical inputs are being promoted. The Swiss agro-ecosystem management approach is based on Integrated Production (IP) practices which encourage a reduction in the total amount of chemicals used in vineyards.[1]

IP practices were developed and tested by the Swiss Federal Research Institute over several years before they were recommended to the wine industry.[6]

A major goal of this system is to establish and maintain an ecologically diverse flora and fauna within the vineyards of eastern Switzerland. As a result of this ecological diversity, it is hoped that major pest populations will be reduced to tolerable levels.

Although many of the IP practices do not apply directly to viticultural problems in the United States, the Swiss agro-ecosystem approach may provide a framework for managing a reduction in the use of chemicals in U.S. vineyards during the next decade.

The California Certified Organic Farmers (CCOF) organization has undertaken the development and promotion of 'organic' wine grapegrowing in California.[7] However, at present there are a large number of growers utilizing either 'conventional' or a combination of 'conventional' and 'organic' type farming practices which may benefit from this approach.

Organization and objectives

Since 1986, a system of IP practices has been organized and made available on a voluntary basis to interested growers throughout eastern Switzerland.[1] The research, development, and promotion of the system was carried out by Swiss Federal Research Station personnel at Wadenswil.[5]

The future organization and operation of the system will be conducted by the Swiss Vinegrowers' Association, with the help of a Technical Commission made up of representatives from the different viticultural regions and the Swiss Federal Research Station at Wadenswil.

Objectives of the agro-ecosystem approach are to produce grapes and wines of high quality through the application of ecologically and economically sound procedures and to achieve a general reduction in the use of pesticides and fertilizers.[6]

Viticultural background

The vineyards of eastern Switzerland receive an annual rainfall of 36 to 56 inches, distributed throughout the year.[4] Over 90% of the vineyards have either a permanent cover of native grasses or seeded cover crops. The two main grape varieties are Pinot noir and Muller-Thurgau (Riesling×Sylvaner). The major rootstocks used are Kober 5BB, Teleki 5C, 8A, and Oppenheim #4 (SO4).

The most important problems in vineyards of eastern Switzerland are: 1) *Botrytis cinerea* (bunch rot); 2) *Plasmopara viticola* (downy mildew); 3) *Pseudopeziza tracheiphila* (red burn); 4) *Europoecilia ambiguella* (grape berry moth); 5) *Panonychus ulmi* (European spider mite); and 6) *Teranychus urticae* (two-spotted spider mite).

These problems are addressed during the vineyard planning stage by considering the altitude and aspect of the vineyard, the distribution and total amount of rainfall, and the frequency and intensity of the Föhn (dry SW wind) in selecting the optimum clones and rootstocks for a given site. Plant density, pruning and training, and trellis systems will also affect future plant protection problems.

Several indirect measures have been identified for reducing management procedures with negative effects on the ecosystem. The reduction of nitrogen (N) inputs is very important for reducing the incidence of *Botrytis* and the development of spider mite populations.

The timing of cultivations is used to manage the release of N through soil mineralization processes. Cultivation is done in the spring in order to synchronize the release of N with the intense pre-bloom vegetative growth stage of

Table 1: Examples of pest and disease control aspects of the Wadenswil evaluation system.

		Bonus Points						
Problem & Action	**M***	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**Total**
Spider mites								
Infestation checked in winter	—	no	—	yes or no problem	—	—	—	
Control: acaricides of typhlotoxicity class 1-3 (1=harmless, 3=toxic) Bio=*Typhlodromus pyri*	2-3	1	—	—	none	—	Bio	
Plasmopara viticola								
Small untreated check-plot	—	no	—	—	yes	—	—	
No. of treatments/season where no leaf burn exists	>7	7	6	5	—	—	—	
Typhlodromus toxicity class used (1-3)	3	2	—	—	—	—	1	
Total copper used (kg/ha/yr)	>4	4	3	—	—	2	—	
Cu applied to entire canopy (EC) or only to clusters (CL)	—	EC	—	—	CL	—	—	

M*=Malus point. Will deprive grower of IP certificate.

Table 2: Examples of soil, fertilizer, and nutrition aspects of the Wadenswil evaluation system.

		Bonus Points						
Action	**M***	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**Total**
Last soil test within 4 years	no	yes	—	—	—	—	—	
N applied (kg/ha/yr)	>50	<50	<40	<30	<20	<10	0	
If mineral N applied; 5 untreated control rows maintained	—	no	—	—	—	—	yes or none applied	
Applications of P, K, and Mg exceed soil test recommendations	yes	no	—	—	—	—	—	
Soil organic matter content (%)	<1	1-2	—	>2	—	>3	—	
Heavy metal content of applied compost within allowable limits	no	yes	—	—	—	—	—	

M*=Malus point. Will deprive grower of IP certificate.

grapevines.

Removal of foliage in the grape zone starting in mid-July provides better air circulation, reduces humidity, and, as a result, reduces *Botrytis* infestations.

The maintenance of a green cover crop throughout the year can provide habitat for beneficial insects. Mowing alternate rows is recommended to increase the percentage of flowering plants during the season.

In eastern Switzerland, the predatory mite *Typhylodromus pyri* is currently the main established natural pest control agent which has been identified. It is effectively being used to control

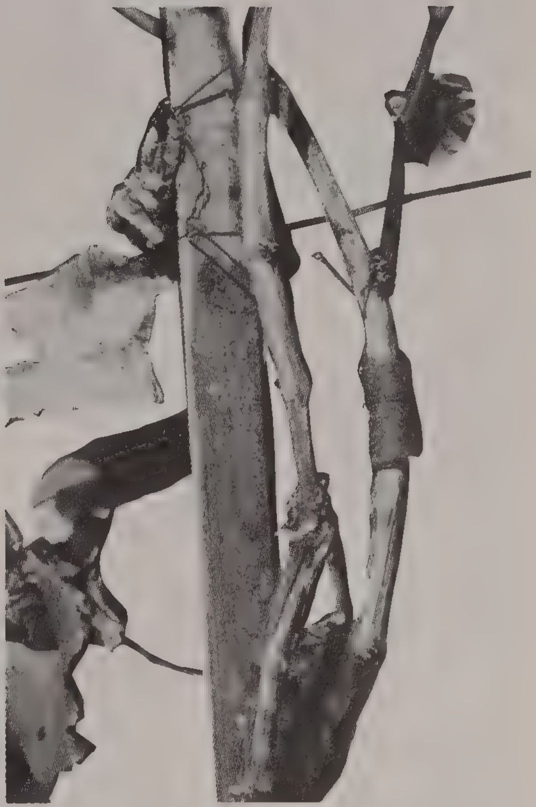

Fig. 1. Wool material tied to the base of shoots. Technique used to inoculate vineyards with the predatory mite *Typhylodromus pyri*.

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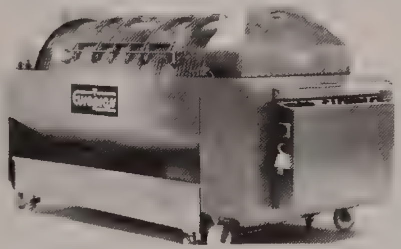

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Panonychus ulmi (European spider mite). All insecticides and fungicides registered for use in Swiss vineyards have been tested and rated with respect to their toxicity to *Typhylodromus pyri*.

Recently, hedges with *Rubus* and *Cornus* spp. in close proximity to vineyards have been recognized as potential sources of *Typhylodromus pyri*. However, the movement of these predators appears to be relatively slow from hedge to vineyard. Therefore, different methods for artificial release have been developed in order to speed up the establishment of new predator populations.

One promising technique for establishing new populations involves tying two to three-inch strips of woolen material at the base of shoots with already established populations of the predator.[3] Since the predators overwinter beneath bud scales, they crawl under the woolen material during the fall. (See Fig. 1) In the spring, the strips of wool with a developing predator population within are removed to a second vineyard for inoculation of the predator.

Implementation of the IP system

The IP system, known as the Wadenswil Model, is being implemented by addressing four key elements:[5]

1) **Clear definitions** of the criteria for IP by means of restrictive guidelines (see Tables 1 and 2). Application of the guidelines must be supervised and failure to accomplish the minimum requirements will lead to the disqualification of the respective grower as an IP grower for that year.

2) **Flexibility** of the system to satisfy local economic or environmental constraints and to incorporate new knowledge.

3) **Voluntary participation** based on a membership application and commitment to implement IP practices on entire vineyard acreage.

4) **Education** of participating growers in the further development of the concepts through seminars and courses.

The system is based on a Bonus-Malus (plus/minus) evaluation system consisting of 50 different viticultural aspects which may have a negative impact on the agro-ecosystem. These aspects are grouped into the following categories: 1) yield and quality; 2) soil and fertilization; 3) soil cultivation and weed control; 4) disease control; 5) pest control; 6) enology; and 7) miscellaneous (training, equipment).

Each of the 50 aspects is evaluated annually on the basis of the action taken by the grower. Examples of different aspects within the Pest and Disease Control category are presented in Table I, and the Soil and Fertilizer category in Table II.

Bonus points are given when the actions taken reduce the use of pesticides, fertilizers, and fuel, and promote 'ecological diversity' within the vineyard. Zero points are given when the actions follow traditional viticultural practices and do not utilize the alternatives available (Tables I and II).

A key component of the system are the 42 well-defined criteria (malus points) that are considered serious violations of the IP objectives. If the grower receives any one of these malus points, his vineyard will not be certified for the current year.

Practices which violate the IP objectives (Malus points) include: overcropping; N fertilization in excess of 50 kg/hectare/year; copper input exceeding four kg/hectare/year; application of more than seven fungicide treatments/season against downy mildew; and application of pesticides that are toxic to predatory mites (i.e. *Typhylodromus pyri*).

The grower and representatives of the Technical Commission evaluate the records for all relevant activities at the end of each season.[2] Based on the number of points accumulated and the absence of any malus points, the grower will receive a certificate which establishes him as a successful participant in the IP program.

Although certain criteria have had to be modified to reflect local climatic characteristics or specific disease problems such as red burn (*Pseudopezicula tracheiphila*), results from three years of testing the system indicate a very high level of acceptance by participating growers.[6]

(Current discussions are underway on how to identify the grapes and wines produced using the IP program. It is hoped that by recognizing qualified growers and their products in the marketplace, other growers will be motivated to shift from conventional grape production practices to the IP system.) ■

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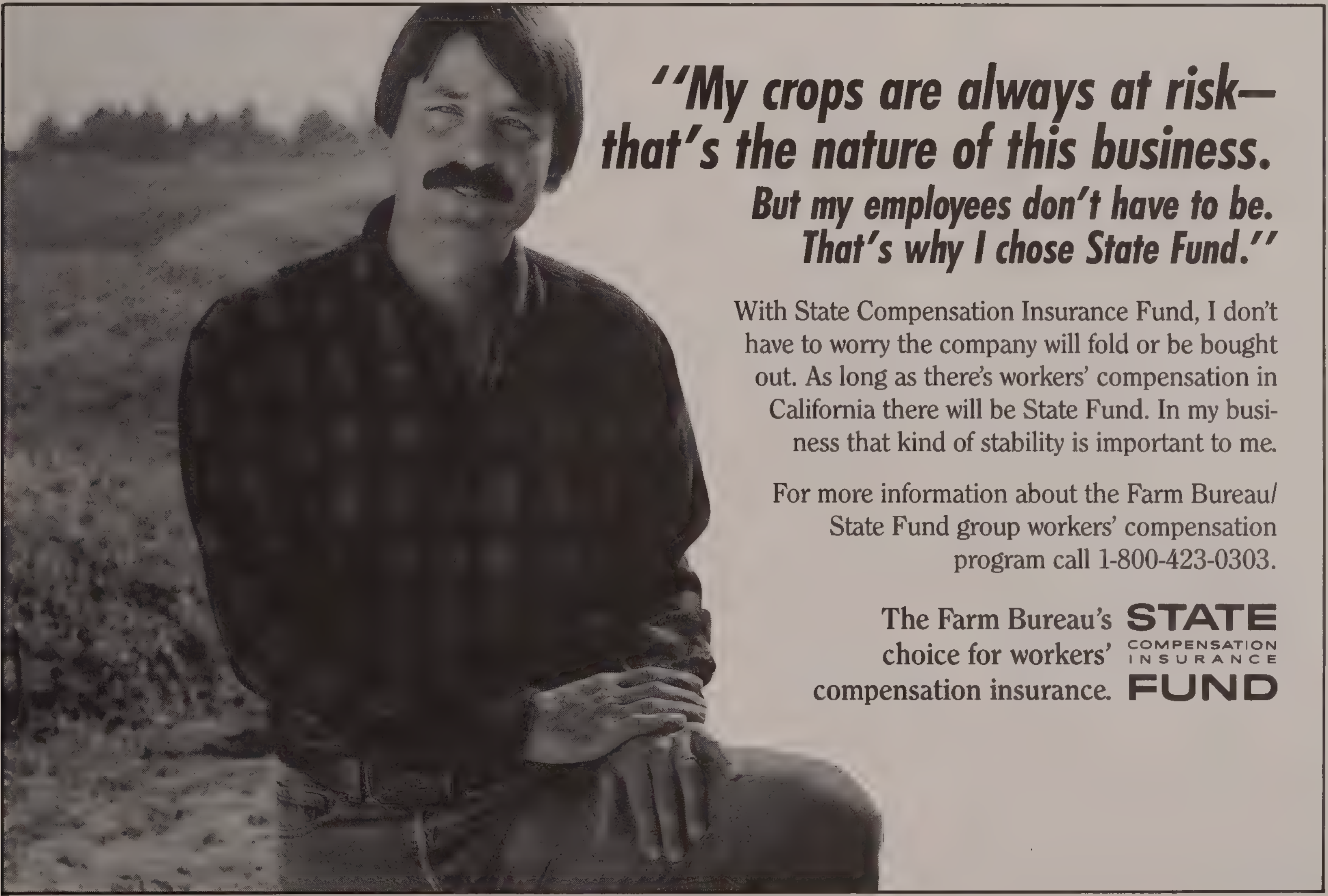
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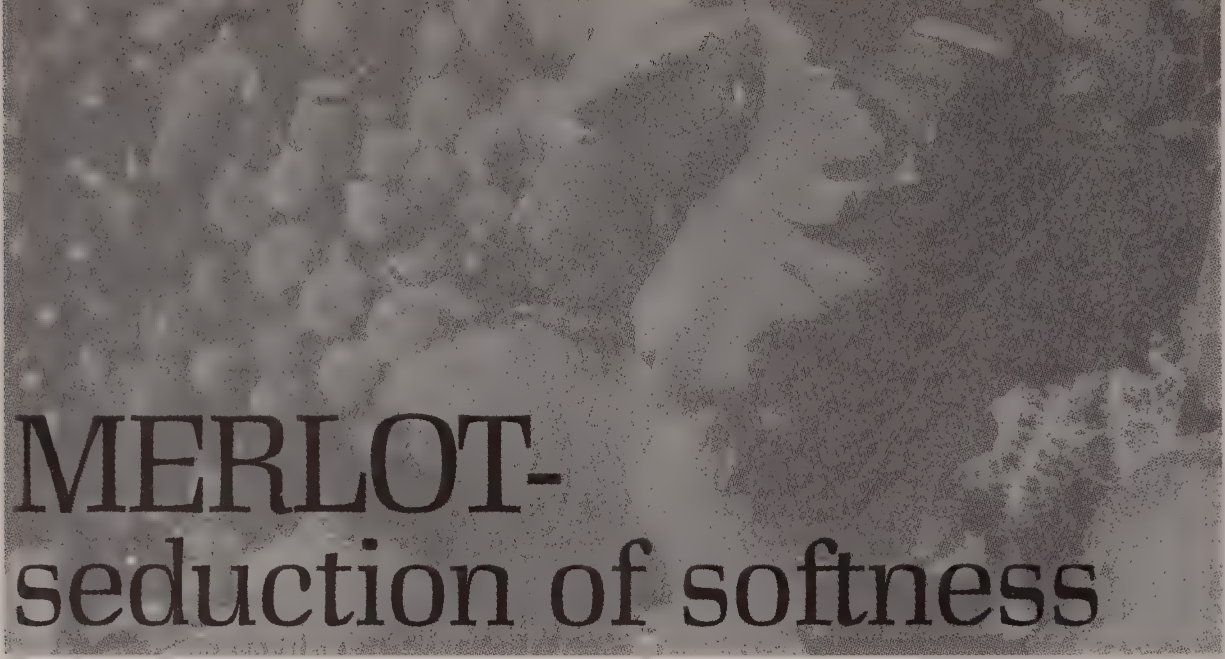


MERLOT-
seduction of softness

By Eleanor & Ray Heald

Merlot is the 'in' varietal among America's growing number of eclectic, premium red wine consumers. Touted as a softer wine than Cabernet Sauvignon, it has enormous appeal and is seducing avowed white-wine enthusiasts.

They are attracted to the round and generous, oft-times fleshy, richly fruity, easily understood, early-maturing yet long-lived characteristics of Merlot.

These marketing aspects cheer the French producers in Pomerol and Saint-Emilion, the California wineries, and the new kids on the block from Washington and Long Island. However, these hotbeds of enthusiasm understand all too well the inherent viticultual problems of Merlot, not least of which is erratic crop levels.

In Pomerol where Merlot is king, it has proven to be perfectly adaptable to the heavy clay subsoil dominant in the region. Even in the most ideal soils, if weather conditions are wet or cold, Merlot is susceptible to *coulure*, the dropping of blossoms during flowering or of the tiny berries post flowering.

An aftermath of *coulure* is *millerandage*, bunches containing stunted pea-size, green berries that never develop further. Unsatisfactory weather conditions during flowering are the cause.

Both *coulure* and *millerandage* may drastically reduce the size of the crop, but the latter brings an additional problem. If the undeveloped green berries are not removed from the bunch at picking, they increase the acidity of the wine.

In California, similar berry and bunch development problems may occur, but are accentuated by excessive heat at flowering. 'Shatter' or the failure of the flowers to pollinate is the basis of extreme crop level swings apparently related to excess nitrogen uptake by the vine.

Some criticism has been leveled against Merlot grown outside its Bordeaux homeland. Lack of varietal intensity, high alcohol, weedy, and vegetal wines have been noted. But producers in eastern Washington are generally delighted with the varietal and the ability to ripen it to a balanced maturity. Weediness is site-specific and not a significant problem in properly managed vineyards.

Given the severe winter conditions of 1990-91, the biggest single problem and one which is currently foremost in the Washington State grower's mind, is Merlot's unfortunate lack of winter hardiness relative to other varietals grown in the region.

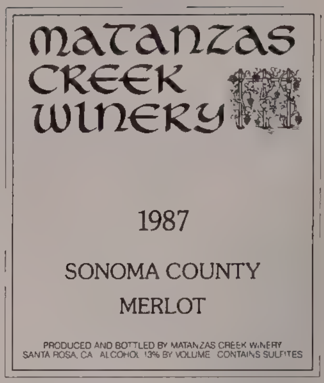
Except for a few research plots, nearly all commercial Merlot plantings (as well as all *vinifera* vines) in Washington State are self-rooted. In 1990, the first-ever phylloxera survey of Washington vineyards was done. Only one vineyard was found to be infested and to date, the pest has not spread to other vineyards. Time may prove otherwise.

Long Island's North Fork is considered by many experts to be the premier red wine region of the northeast. Averaging 210 days, Long Island's growing season is longer than that of the Finger Lake's region and about the same as Bordeaux.

Grape prices for Long Island Merlot ran as high as $1,400/ton in 1990, up from a $1,200 high in 1989.

Thirteen of Long Island's wineries are currently producing Merlot. That number may rise to 17 by 1992. Of Long Island's 1,400 acres of wine grapes, 300 acres are Merlot.

PWV thanks Duckhorn Vineyards for hosting the tasting and the following winemakers for serving on the tasting panel: Kay Simon and Clay Mackey, Chinook Wines; Tom Rinaldi, Duckhorn Vineyards; David Forsyth, Hogue Cellars; Bill Parker and Susan Reed, Matanzas Creek Winery; and Tom Mackey, St. Francis Vineyards.



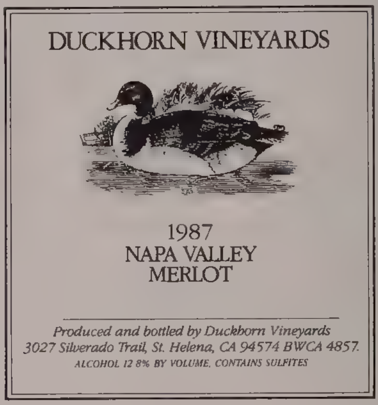
MATANZAS CREEK WINERY

1987

SONOMA COUNTY

MERLOT

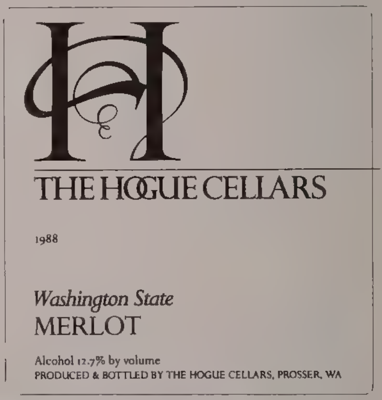
PRODUCED AND BOTTLED BY MATANZAS CREEK WINERY
SANTA ROSA, CA ALCOHOL 13% BY VOLUME CONTAINS SULFITES



DUCKHORN VINEYARDS

1987
NAPA VALLEY
MERLOT

Produced and bottled by Duckhorn Vineyards
3027 Silverado Trail, St. Helena, CA 94574 BWCA 4857.
ALCOHOL 12.8% BY VOLUME, CONTAINS SULFITES



THE HOGUE CELLARS

1988

Washington State
MERLOT

Alcohol 12.7% by volume
PRODUCED & BOTTLED BY THE HOGUE CELLARS, PROSSER, WA

Bedell Cellars

North Fork of Long Island

MERLOT
1987

Grown, Produced, and Bottled by Bedell Vineyards
Cutchogue, New York
Alcohol 12.5% By Volume Contains Sulfites

1988

ST. FRANCIS

ESTATE BOTTLED

SONOMA VALLEY

MERLOT

Reserve

Bedell Cellars

Cutchogue (Long Island), NY
Kip Bedell, winemaker

Style: Bedell Cellars is striving for a wine with upfront fruit balanced by toasty oak. They want it soft, but with well-structured tannins.

Vineyards: The vineyards are sandy loam for a depth of 1.5 to 3.0 feet with a sand/gravel subsoil.

Twenty percent of the average eight to ten-year-old vines are vertically trained (one fruiting wire and four catch wires) with a single canopy. These vines are planted 8×9 feet. The remaining 80% (planted 7×9) are high-wire cordon with one fruiting wire.

All vines are double trunks and are principally cordon/spur pruned to an average of four shoots per linear foot of trellis. The rootstock for 60% of the vines is 5C and the remainder are on SO4.

Canopy manipulation for the low-wire system includes suckering, renewal tying, shoot thinning, shoot positioning with catch wires, hedging twice in summer, leaf pulling, and selected cluster removal.

The high wire trellis is manipulated as above except summer pruning and leaf pulling are omitted. Shoot positioning is done without catch wires.

Water uptake in some parts of the vineyard has caused excessive shoot growth. Permanent sod row middles, have helped to stabilize vine size.

Bud break occurs about May 1, bloom around June 25, veraison in mid-August, with harvest approximately October 1.

An average of ten fungicide sprays/season begins at one-inch shoot growth. An integrated pest management approach is followed with frequent vineyard scouting for selected insecticide sprays.

Vine nutrition is monitored through petiole analysis.

The harvest window is 21.5° to 23° Brix, a TA greater than 0.70, and pH less than 3.4.

Winemaking: Grapes are destemmed, crushed, and inoculated immediately with 2-lb/1,000 gal active dry Pasteur Champagne yeast. Fermentation completes in closed-top fermenters where the maximum juice temperature is 75° to 80°F and maximum cap temperature is 85°F. Pump-over is twice/day for the first four days. Pressing is done ten to 15 days after dryness.

Acid corrections are made if the pH is greater than 3.6 after malolactic fermentation completes in tank (induced with a 2% inoculum).

SO_2 of 50 ppm is added after MLF completes and the wine goes to a mix of about ⅓ new, 60-gal, American and French oak barrels for 12 to 14 months.

Racking (by pump) is done every four months with minimal aeration. Molecular SO_2 levels are maintained at 0.50 ppm.

To add an additional layer of complexity, the wine is usually blended with 5% to 10% Cabernet Sauvignon after nine to ten months.

When required, egg white fining (one to two/barrel) is done and the wine is racked off in two to three weeks.

The wine is bottled with one medium pad filtration about 17 to 18 months after harvest. At bottling, the TA is about 0.70 with pH at 3.5 to 3.6.

Tasting Notes: 1987 Bedell Cellars Merlot

Color/Aroma: Red-garnet with hints of brick. Lean fruit with beet-like, casky character. Jammy fruit with leather and tobacco notes; slightly overripe qualities.

Flavors: Fruit buried by harsh wood components; medium body and tannins; lean; slight acidic bite; medium length.

Balance/Finish: Clean, quaffable, enjoyable table wine.

Chateau Fombrauge

Saint-Emilion, France
Ugo Arguti, Maitre de chai

Style: The principal goal for wine production at Chateau Fombrauge is the expression of the Saint-Emilion appellation — elegant, flattering, powerful, with a good constant balance. An expressive nose, deep color, and lengthy finish are essential.

Vineyards: Dating back to the 16th century, the vineyards of Chateau Fombrauge are among the oldest in Saint-Emilion. The estate covers 188 acres, of which 130 acres are currently producing.

The vineyard, with an average vine age of 27 years, is planted 1.45m×1.25m in calcareous soil with 60% Merlot, 25% Cabernet Franc, and 15% Cabernet Sauvignon. It is Guyot Simple trained. Vines are hedged in the Bordeaux tradition and leaves are pulled at the beginning of September. On average, yields are 45hL/ha (3.0 tons/acre).

Only organic manure is used as fertilizer.

Bud break occurs at the beginning of April; bloom at the beginning of June; veraison in late July or early August; with harvest the last week of September.

The principal picking parameters are a TA of 0.34 and pH about 3.5.

Winemaking: Grapes are destemmed and crushed with approximately 30% berry maceration.

Diammonium phosphate is used to activate the natural yeast. During fermentation in closed-top fermenters, juice temperature reaches 86°F and the cap maximum is 88°F.

Juice is pumped through the skin-cap twice each day. The total skin contact period extends four to five weeks.

SO_2 levels are brought to 20ppm free after malolactic fermentation completes in tank. SO_2 levels are maintained be-

CHATEAU FOMBRAUGE
1985
Saint-Emilion Grand Cru
APPELLATION SAINT EMILION GRAND CRU CONTROLEE
Sté DE FOMBRAUGE A St CHRISTOPHE DES BARDES (GIRONDE)
MIS EN BOUTEILLES AU CHATEAU

tween 15ppm and 20 ppm free during the 12 to 16-month barrel regime in ⅓ new 225L barrels.

Every three months during the barrel ageing period, the wine is racked barrel to barrel by gravity with aeration. In mid-March, five egg whites/barrel are used for fining.

Preliminary blending of approximately 70% Merlot, 15% Cabernet Sauvignon, and 15% Cabernet Franc is done in April following harvest. The blend is finalized in September.

The wine is bottled in the second June following harvest. At bottling, SO_2 levels are 20ppm free with a total of 40ppm and the pH is near 3.6.

Tasting Notes: 1986 Chateau Fombrauge

Color/Aroma: Brick and garnet. Distinct, tea-like spiciness; jammy, chocolate, anise.

Flavors: Candied apples, raisins, toast, sweet oak; berryish with hints of herbaceousness; moderate tannins.

Balance/Finish: Soft; clean with good overall balance.

Chateau Lafleur

Pomerol, France
S. & J. Guinaudeau, managers

Style: Chateau Lafleur in Pomerol is one of the 12 chateaux (including Chateau Petrus) in the Etablissements Jean-Pierre Moueix.

The wines of Chateau Lafleur are classic Pomerol with lively aromatics. They are full-bodied and lush with firm structure, good balance and finesse.

Vineyards: In one plot of approximately 11 acres, seven parcels form a large square, perfectly situated on the Pomerol plateau. The soil is gravelly-clay, more than 40% of which is composed of pebbles. Clay content is about 10% with naturally high levels of phosphoric acid and potassium.

Averaging 30-years-old, 5,900 vines are planted 1.3m×1.3m principally on 3309 Couderc rootstock, with some 420A Millardet/de Grasset. Vines are evenly divided, 50% Merlot and 50% Cabernet Franc.

Given the natural richness of the soil, only bovine manure is added as fertilizer.

Canes are pruned to four or five buds in one direction only.

Standard spraying techniques are employed from budbreak to flowering. After that, the Bordeaux mixture ($CuSO_4$ plus slaked lime) and sulfur is used. Anti-botrytis sprays are not used because the trellising methods and microclimate do not justify it.

Grapes are hand-harvested and picking decisions are made at the last minute of optimum maturity. It is done in dry weather in one or two days. Sorting is done manually in the vineyard by the pickers. Two passes allow separate harvesting of young and old vines.

Yields average 26hL/ha (1.7 tons/acre).

Winemaking: Batches from old and young vines are vinified separately, but by the same methods, throughout the winemaking process.

Grapes are destemmed and crushed. During fermentation, temperature is controlled at 86°F to 90°F using an external heat exchanger. Moderate pump overs are done twice daily using a volumetric pump.

Maceration extends from 17 to 25 days.

About December, after malolactic fermentation completes in tank, the wine is transferred to barrel (⅓ to ⅔ new wood depending on the vintage).

The wine is racked every three months using a hand-operated air pump.

During the second winter, the wine is egg-white fined in barrel. The wine receives a light pad filtration after 20 to 24 months and is bottled.

Average production levels are about 1,000 cases/year of Grand Vin de Chateau Lafleur (old vines) and 250 cases/year of Pensees de Lafleur (young vines). In 1987, vintage conditions allowed production under the second label only from both old and young vines.

Tasting Notes: 1986 Chateau Lafleur

Color/Aroma: Ruby red with slight brick. Smoky, complex cherries and oak; mullberries; vinous; dried fruits; spicy.

Flavors: Tart; full wood flavors; dried strawberries; mullberries.

Balance/Finish: Generally soft, but with some harsher barrel tannins in background; ponderous; good structure and depth; well-balanced.

Chinook Wines

Prosser, WA
Kay Simon/Clay Mackey, co-winemakers

Style: Chinook's winemakers produce a Merlot which is consumable on the date of release, yet a wine that will age for several years for the consumer who may want to cellar it.

The first goal is achieved by manipulating punch-down of the cap during primary fermentation and gentle pressing. Paying close attention to the pH of the finished wine accomplishes the second intent.

Vineyards: Grapes for the blend are purchased from two Merlot vineyards and one Cabernet Sauvignon vineyard, both in the Yakima Valley. The vines are planted on their own roots at approximately 600 ft. elevation. The average growing season is 150 days.

Winter injury is the most severe potential problem. In one vineyard, large berry size (leading to poor color development) has been a problem. Exposing the fruit and thinning have helped.

Vines in the Boushey Vineyard are nine-years-old and spaced 8×9 and the 13-year-old vines in the Carter Vineyard are spaced 7×10. Boushey has 15 feet deep of sandy loam over clay over basalt. Carter is extremely sandy with 1-ft. to 5-ft. of topsoil over basalt.

Bilateral cordon with two vertical catch-wires is used in the Boushey Vineyard. The fan system with three or four trunks/vine is used by Carter with one single wire. The fan system is used in many eastern Washington vineyards because it is thought to be a hedge against winter damage to trunks, *i.e.* in a year where a trunk is lost there are ready replacements without waiting for years to retrain the vine before producing a crop again.

The Boushey Vineyard is spur-pruned to about 40 buds/vine; up to 50 in a year with potential winter damage. With the higher number of buds left, thinning would occur if necessary to two clusters/shoot. Pruning is done in late March, sometimes even April as a hedge against winter injury. In the Carter Vineyard, there are 36 buds per set of trunks, or approximately 18 2-bud spurs.

When they thin the Boushey Vineyard, the canes are bent up onto the catch wire to better expose the fruit. Suckering is done in the Carter Vineyard three times, early June, late June, mid-July.

Typical crop levels are 4 to 4.5 tons/acre in the Boushey Vineyard and 4.4 tons/acre average in the Carter Vineyard.

These two vineyards are only six miles apart but display quite different flavor characteristics, and the Boushey ripens signficiantly later. Boushey is generally pure berry-cherry in flavor and lighter in color. Carter is always more herbaceous, though less vigorous. There is noticeably more color in the Carter every year and generally higher alcohol content.

Harvest parameters for 56% of the Merlot picked in 1987 was 23° Brix, 0.59 TA, and 3.46 pH. The remaining 44% were 23.8° Brix, 0.75 TA, and 3.55 pH. At these Brix and pH levels, the winemakers contend that the fruit had flavors typical for the variety and the individual vineyards.

Winemaking: Grapes are destemmed and crushed directly into an open-top fermenter. The aim is to have color extraction begin immediately because the style dictates a fairly fruity wine.

Approximately 25ppm SO_2 is added to the must. Further additions of 15ppm to 30ppm free and less than 100ppm total are made in the post-malolactic fermentation period.

French Red yeast is purchased on a slant and multiplied in juice for inoculation. Approximately 3-gal/500-gal constitutes the active starter. Inoculation is made 12 hours after crushing.

Maximum juice temperature is 80°F and maximum cap temperature reaches 85°F.

The cap is manually punched down once or twice daily, but during the vigorous fermentation period, punch-down is done three or four times/day. The total skin contact time is six or seven days.

Press run juice is tasted toward the end of the press cycle to determine cut-off.

Wine goes to a mix of one to five-year-old (80% French, 20% American) oak barrels upon completion of ML fermentation. The wine remains in 60-gal barrels for one year (with one aeration racking) followed by approximately nine months in upright oak tanks.

Merlot from the two sources is blended after one year. Blending with approximately 15% Cabernet Sauvignon is done prior to bottling.

At bottling, TA measures 0.60 to 0.65 with pH in the range of 3.45 to 3.50. The wine is bottle-aged a minimum of six months before release.

Tasting Notes: 1987 Chinook Washington Merlot

Color/Aroma: Medium, ruby-red. Metallic, sharp, toasty, smoky; vinous; cherry, berry.

Flavors: Candy apples, plums, jam, honey, acidic, tart, mouthfilling; lush berry flavors; gentle spice.

Balance/Finish: Round, full mouthfeel; soft tannins; medium-long finish.

Duckhorn Vineyards

St. Helena, CA
Tom Rinali, winemaker

Style: Rinaldi contends that they want to produce world-class vintage wines, re-

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flective of each year's idiosyncrasies, yet consistently delicious.

Vineyards: Duckhorn purchases a large percentage of its 100% Napa Valley grapes. Twelve vineyard locations extend from Carneros to Calistoga and from Spring Mountain to Howell Mountain in Davis regions I through III.

Vines from the various sources range in age from six years to over 30 years, with an average of 10 to 12 years. The 25 growers are allowed to farm and manage their vineyard within certain winery guidelines.

Typically, the vines are T-top trellised and cane-pruned to ten to 12 buds/cane and approximately 30 buds/vine. Dictated by vigor, some sites have a high wire (vertical) canopy. The crop is thinned to optimum level, depending on the growing season. Leaf pulling is commonly practiced along with hedging when necessary.

Vines are typically spaced 6×10 mainly on AXR-1 rootstock. The soils are generally lean and nitrogen-poor. Even with the diversely situated vineyards, shatter and poor set are common.

Sites are drip-irrigated or dry-farmed. Except in unusual circumstances, no watering is done after July 31. The vineyards are not fertilized. Sulfur is the typical spray with no residual allowed on the fruit.

Picking decisions are based on pH, appearance of the vine, weather, site considerations, sugar, acidity, and taste. An average harvest window is 22.5° Brix, 0.68 TA and 3.35 pH.

Winemaking: Rollers on the variable-speed crusher/destemmer exert an approximate 50% to 70% berry maceration. Rinaldi contends that 30% to 50% whole berries aid a longer, cooler fermentation resulting in young wines with fruitier taste.

While the following represents typical winemaking techniques, each lot is treated individually where particular temperatures, aeration, or extraction may be unique.

Must is inoculated at crush with 2-lb/1,000-gal active dry Fermivin yeast. Fermentation takes place in closed top tanks. Juice reaches a maximum of 80°F with cap maximum at 85°F.

Pumping over is done two or three times daily. Total skin contact is 9 to 15 days and the wine is usually pressed within one day of achieving dryness. Rinaldi maintains that maximum extraction occurs during the 18° to 5° Brix fermentation period.

Wine is acidulated to 0.68 if the acid is 0.50 or lower with a maximum allowable pH of about 3.85.

Free SO_2 levels are brought to 25ppm after the wine is dry, preferably after completion of ML fermentation, but not necessarily. The determining factor is pH.

The wine begins barrel ageing as soon as possible. Principally, Nevers oak, 60-gal, ⅓ new to a maximum of six-year-old barrels are used.

Racking without aeration is done three to five times/year. Depending on pH, free SO_2 levels are maintained at 20ppm free and approximately 65ppm total.

While it varies from year to year, a 'typical' Duckhorn Merlot is 85% varietal, blended with 12% Cabernet Sauvignon and about 3% Cabernet Franc. Blending is done throughout barrel ageing and is completed two months before bottling. Percentages in the blend are determined by a desired balance between mountain and valley fruit character, softness, complexity and a 'mystery' element in the wine.

Depending on the wine, up to four egg whites/barrel are used for fining in the barrel. After two to eight weeks, the wine is racked off the fining agent.

A medium pad filtration is done prior to bottling, approximately 18 months after harvest. At bottling, SO_2 levels are usually 25ppm free and 80ppm total; TA ranges 0.5 to 0.7 with 3.3 to 3.5 pH. The wine is released six months to one year after bottling.

Tasting Notes: 1987 Duckhorn Napa Valley Merlot

Color/Aroma: Ruby-red. Distinct plum fruit; vanilla background; licorice and cinnamon spice; black cherries.

Flavors: Layers of fruit; plums; good viscosity; berryish fruit; spicy; rich and concentrated.

Balance/Finish: Fruit is emphasized; round with good tannin levels for ageability; well-structured.

Hogue Cellars

Prosser, WA
Rob Griffin/David Forsyth, co-winemakers

Style: The goal is to preserve the rich, full berry flavors of Washington grapes. The grapes also contribute spiciness which matches well with spice contributed by American oak. Moderate tannins, together with oak hints offers the wine structure and some ageing potential.

The resultant wine has raspberry/blackberry aromas in harmony with cedar spice. Flavors follow with a rich, full mouthfeel and lengthy finish.

Vineyards: The 1987 vintage is a blend of four vineyards, averaging eight to ten-years-old, located in the Yakima and Columbia Valley AVAs.

Self-rooted vines, mostly spaced 7×10, are trained on a single vertical catch wire. Some of the newer vineyards have a four-wire vertical trellis with two moveable wires.

Vines are pruned in February to two-bud spurs with 28 spurs/vine. To manage the canopy in the growing season, cordon suckering (in early May) and leaf stripping (between fruit set and pea-size grapes) are done as required about mid-June.

Leaf stripping is done in particularly vigorous blocks to expose fruit to some sunlight to avoid the vegetal flavors associated with a dense canopy. Basal leaves in the fruit zone on the north or east side of the vine are stripped to open up the canopy so as not to expose the clusters to the hot afternoon sun and raisin the fruit.

Average yield in the Davis Region II-III, sandy/loam soil vineyards is four to five tons/acre.

Forsyth reports that winters present the biggest problem to growing Merlot. Sustained periods of 0°F to −5°F temperatures can kill buds, cordons, and trunks in that order.

Bud break occurs during the second week of April; bloom the first week of June; veraison is early to mid-August with harvest the last week of September to the first week of October.

Both drip and sprinkler irrigation are employed. Early in the season, moisture levels are kept near the soil capacity. As the season progresses, the soil profile is allowed to dry from the bottom up. This allows easy control of the moisture level and the vine can be stressed if needed.

Experimentation with water stress in post set and veraison to control berry size and vine vigor is being assessed. A post harvest irrigation is applied to fill the soil moisture profile and help the vines through the winter.

Because botrytis is not a problem with Merlot, no sprays for rot are used. For mildew, flowable sulfur is applied at one-inch shoot growth and repeated at 10 to 14-day intervals until 12 to 14-inch shoot growth is reached. Then, Rubigan or Rally are used at 17 to 21-day intervals.

Insect levels are closely monitored. If an insect population and damage exceeds tolerated levels, the appropriate spray is applied. Safer Soap is being evaluated for its effectiveness.

Developed fruit flavor is the foremost harvest parameter followed by a window of 22.0° to 23.0° Brix, 0.6 to 0.8 TA and 3.4 to 3.5 pH.

Winemaking: Grapes are crushed with 90% berry maceration to facilitate maximum color and flavor extraction during the eight to 14-day fermentation. Must acidulation is made to a TA of 0.70 to 0.84 and pH of 3.30 to 3.50.

Immediately following crush, the must is inoculated with 2-lb/1,000-gal of active dry Champagne yeast. Fermentation proceeds in closed-top fermenters with maximum juice temperature at 80°F and cap maximums at 80° to 85°F.

A centrifugal pump with a spray device is used to wet the cap for 15 minutes, every three to four hours.

Pressing is done at near-dryness because experiments with extended maceration achieved a higher volatile acidity and higher tannin levels while tying up valuable red fermenter space.

Additionally, the winemakers believe that proper color and stability is foremost a function of proper vineyard management, growing season, and time of harvest. Crop load, berry size, vine vigor, and temperature during ripening all affect stable color development.

They also contend that frequency of pumping over will determine color extraction to a point and that color stability is a function of pH and oxidation. Therefore, in their opinion, it is essential to maintain pH in the range of 3.4 to 3.6 and minimize oxygen pickup in the later stages of cellaring.

SO_2 levels are brought to 50ppm free in the post yeast and post ML fermentation periods. Depending on the availablity of barrels, the wine begins barrel ageing as soon as one month post fermentation. However, some wine remains in tank for up to six months with two to three rackings before going to barrel.

The wine ages in new to three-year-old fire-bent, oak-toasted American oak barrels for 12 to 18 months.

If the wine received a couple of rackings prior to going to barrel, it may be racked only once more while in barrel. If a turbid wine is placed in the barrel, it will be racked in two to three months. During this period, SO_2 levels are maintained at 30ppm to 40ppm free with 100ppm total at the upper limit.

Depending on the vintage, 5% to 25% Cabernet Sauvignon will be blended two to three weeks prior to bottling. It is believed that Cabernet Sauvignon adds richer berry flavors to the Merlot, while simultaneously adding more structure and backbone. Often, Washington State Merlot can be a bit too fleshy, ripe or rich by itself. Cabernet Sauvignon gives the wine defined fruit character and richer mid-palate expression.

Fining is done only when excessive tannins are present. Individual lots are gelatin-fined rather than the entire blend. Racking off the fining agent is done in two to three weeks.

The wine is given a DE-filtration after barreling and blending. There is a $.08\mu$ pad filtration ahead of the filler approximately 18 months after harvest.

At bottling, free SO_2 levels are at 28ppm to 32ppm free and 80ppm to 110ppm total. TA is 0.65 and pH 3.45 to 3.55. Bottled wine is retained for three to six months

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before release.

Tasting Notes: 1987 Hogue Cellars Merlot

Color/Aroma: Medium garnet. Licorice and anise spiciness; tea-like; cherry-berry.

Flavors: Vanilla, rum raisin; sweet, plummy fruit; cherries; fleshy; mouth-filling.

Balance/Finish: Round, ripe and what Merlot ought to be; most enjoyable now, but has ageing potential; solid finish.

Matanzas Creek Winery

Santa Rosa, CA
Susan Reed/William Parker, winemakers;
Tom Freitas, vineyard manager

Style: An opulent, rich, deeply-flavored, full-bodied wine with supple tannins and a high degree of complexity to provide both early accessibility and ageability. The myriad of flavors also makes it complementary to many foods.

Vineyards: Located in Bennett Valley, east of Santa Rosa in the Sonoma Valley AVA, 15-year-old vines, planted 8×12 on AXR-1 rootstock, are trained on three different systems.

About 7.5 acres are on a three-wire T-top with one fruiting wire. Two acres are on a Lyre system with two fruiting wires and the balance is on a three-wire T-top with two fruiting wires.

The vineyard is in Davis Region I with an average of 2,350 degree days. The soil is clay loam about one to 2.5 feet deep with some hard pan.

Between mid-December and mid-January, vines are pruned to two to four canes with three to four renewal spurs and 12 to 14 buds/cane.

Two canopy manipulation techniques are employed: next year's canes are tied up for good sun exposure and moveable foliage wires are utilized in the lyre.

Vines are suckered between April 15 and May 15. Shoots are tied during the month of May and leaves are pulled June 15 to July 15.

Matanzas Creek statistics illustrate the high degree of erratic crop levels. Since 1983, T-top trained vines average two tons/acre with a low in 1988 of 0.94T/ac and a high in 1989 of 4.15 T/ac.

Since 1986, the lyre system has averaged 4.11 T/ac with a low in 1988 of 2.48 T/ac and a 1989 high of 8.26 T/ac.

Bud break can occur between March 1 and April 15; bloom May 15 to June 15; veraison July 21 to August 10; and harvest September 23 to October 23.

The vineyard has drip irrigation with two emitters/vine. Beginning approximately May 1 and extending through bloom, 12 to 24 gallons of water/week are applied. Depending on the weather, this amount may be cut to seven gallons/week.

In some years, the vines have been watered up to five days prior to harvest. A post-harvest irrigation of 24 gallons/vine is made.

Starting at the four to six-inch shoot stage and continuing until veraison, vines are sulfur-dusted at 10-lbs/acre every 10 to 14 days. One or two wettable sulfur applications (2.5 to 5-lbs/ac in 150-gal of water) are made depending on weather conditions.

Based on petiole analysis, a fertilizing program for zinc, calcium, and magnesium deficiencies may be employed.

Typical harvest parameters are: 23.0° to 23.5° Brix, 0.60 TA, and approximately 3.5 pH. Vine and berry status together

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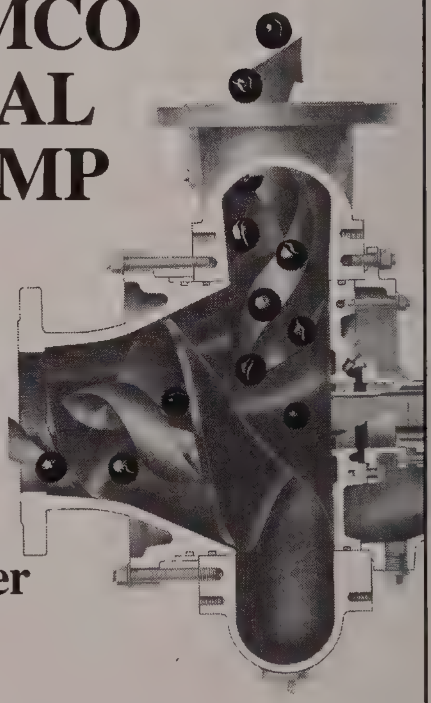

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with grower input are also important.

Winemaking: Due to Merlot's small berry size, approximately 10% of the grapes go to the fermenter uncrushed. The day following crush, the must is inoculated with 2-lb/1,000-gal active-dry Prise de Mousse yeast in closed top fermenters.

Three times daily until dryness, the fermenting must is aerated and pumped over using a sprinkler device. Pump-over continues once per day, on the average, until the wine is pressed. Total skin contact time is three to six weeks.

SO_2 is added for the first time at 30ppm after racking from the drain and press tank. The wine goes to barrel one day after racking.

New to two-year-old French Taransaud/Vicard 60-gallon barrels are used for the 18-month barrel regime. The wine is racked every three months with aeration during the first year only. Free SO_2 levels are maintained at 15ppm.

In December of the harvest year, a blend is made with Cabernet Sauvignon for structure and flavor complexity and Cabernet Franc for heightened aroma and complexity.

After 15 months in barrel, the wine is given an egg white fining with three to four egg whites/barrel, if needed. A final racking is done one month later.

The wine is bottled in late May of the second year following harvest. At this time, SO_2 levels are approximately 25ppm free and 70ppm total. The TA is approximately 0.63 with a pH of 3.6. The wine is released to market ten months later.

Tasting Notes: 1987 Matanzas Creek Winery Merlot

Color/Aroma: Ruby red with purplish hues. Spicy, nutmeg, chocolate; slight tea; French oak, tobacco, cedar.

Flavors: Round, rich, mouthfilling; fruity; berries and oak; flavors complement aromas.

Balance/Finish: Well-formed, delicate; elegant; lengthy.

Palmer Vineyards

Aquebogue (Long Island), NY
Gary Patzwald, winemaker

Style: Producing a red wine varietal exhibiting recognizable aroma and flavor characteristics of Merlot is the intent at Palmer Vineyards. Ageing in French and American oak complements, but does not dominate fruit aromas and flavors of the Merlot grape.

Vineyards: Palmer has two vineyards located on Long Island's North Fork. Four acres are at the winery site. There are five more acres at Great Pond Vineyards.

The Palmer block planted on Riverhead Haven soil has a four to eight-inch topsoil. The vines were trained on a Hudson River Umbrella System (high wire cordon) and changed to a 3-foot low wire cane system with double trunk, one fruiting wire, and two moveable sets of catch wires for vertical trellising.

In mid to late February, the vines (planted on 3309 and 5BB rootstock spaced 8×9), are pruned to two fruiting canes, two renewal spurs and 12 to 14 buds/cane.

Bud break occurs about May 15; bloom around June 15 to 20; veraison in the first week of August and harvest anywhere from October 1 to 25.

Suckering is done in late May. Hedging is done twice beginning early in July followed by mechanical leaf pulling at the end of July.

A drip irrigation system is used principally as a stress management tool due

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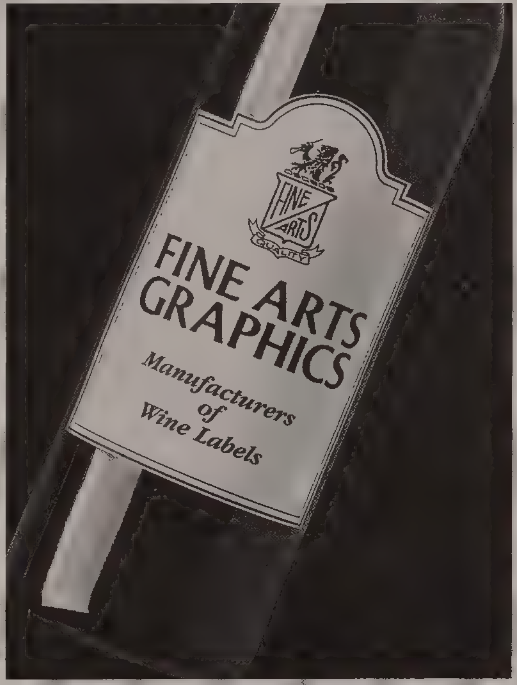

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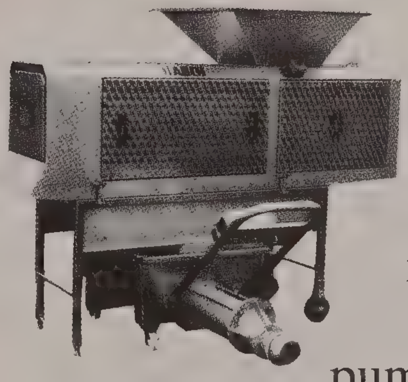

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to sloped hill and sandy soil.

An average of 10 to 12 preventative sprays/season are made for grape berry moth, black rot, powdery mildew, and downy mildew.

Calcium nitrate at 50-lbs/acre is applied in the pre-bloom period. Foliar sprays are used to adjust other nutrient deficiencies identified through petiole analysis.

Picking decisions for crop loads of two to three tons/acre are based principally on a pH less than 3.5 with fruit flavors reminiscent of blackberries, cherries, and black currants. Additionally desirable are 21° to 22° Brix and a TA of 0.75 to 0.80.

Winemaking: Machine-harvested fruit is destemmed and crushed to contain less than 2% whole berries. The must is immediately transferred to closed top fermenters and inoculated the same day with 2-lb/1,000 gal active dry Pasteur Champagne yeast.

Following overnight maceration, a sample is drawn to determine the rate of chaptalization. Musts below 22° Brix are adjusted with cane sugar at 0.12 lbs/gal of must/1° Brix.

The twice daily pump-over schedule for sunny, warm vintages utilizes 10 minutes/2.5-tons of fruit. In rainy, cloudy vintages, pump overs are reduced in duration and frequency. Juice temperatures are maintained at 80°F to 85°F and a maximum cap temperature of 90°F.

During the seven to 12-day maceration period, tanks are pumped over the cap once each day for five minutes. CO_2 is maintained in the headspace and tanks are closed.

When necessary, acidulation to a TA of 0.55 to 0.60g/100mL is done in the post MLF period.

SO_2 at 30ppm to 40ppm is added after MLF completion and again prior to wine transfer to barrels in late January or early February. Barrel ageing utilizes 60-gal, new to four-year-old Nevers oak for 10 to 12 months. SO_2 levels are maintained at 15ppm free and 70ppm total.

The wine is racked once with minimal aeration in July.

After MLF completion or during the summer following harvest, the wine is blended with 10% to 15% Cabernet Franc.

The wine is given one coarse filtration prior to bottling 12 to 15 months after harvest. At bottling, SO_2 levels measure 25ppm free and 110ppm total with TA of 0.60 to 0.65 and pH in the range of 3.5 to 3.6. The wine is released 10 to 12 months later.

Tasting Notes: 1987 Palmer Vineyards Merlot

Color/Aroma: Medium garnet. Smoky; black cherry, leather, seakelp; cherry Koolaid.

Flavors: Full; slightly vegetal; green beans; strawberry, blackcherry, tart, clean.

Balance/Finish: Velvety and almost too soft for varietal; well-balanced, medium-long finish.

St. Francis Winery

Kenwood, CA
Tom Mackey, winemaker

Style: St. Francis seeks to make a wine which, like the wines of Pomerol, accentuates the color, tannin, and body of a claret with the bouquet, floral characteristics, and richness of a Burgundy.

To this end, there is no blending with another varietal, to let the grape display

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its varietal character. Minimal cellar treatment retains much of the grape's varietal flavor.

Vineyards: St. Francis' Merlot vineyard is located in the Sonoma Valley AVA on loamy soil with the gravel and rock outcroppings of a centuries-old river bottom.

Vines of the Martini clone averaging 19 years of age, spaced 8×12, with 450 vines/acre, are on AXR-1 rootstock. Vines are trained on a vertical trellis with one fruiting wire at 48 inches and a canopy wire at 60 inches. To reduce vigor, a bilateral cordon with kicker cane is pruned to two to three buds/spur in January.

Bud break is early April and bloom occurs in late May or early June. At this time, suckering is done and shoots are tied. Leaves are pulled in early June on the eastern side and in early August on the western side. Veraison takes place in late July or early August and harvest occurs October 10 to 15.

Basically, the vineyard is dry-farmed. When necessary, drip irrigation supplements 30 to 36-gal/vine annually.

At four to five-inches of shoot growth, sulfur and Bayleton with zinc sulfate initiates the spray program. This is followed with application of dry sulfur every 14 days until August 15.

Crop levels average five to seven tons/acre.

A typical harvest window is 23.5° Brix, TA 0.75 to 0.85, and pH of 3.3 to 3.4. Additional picking criteria includes color in the pulp and varietal taste.

Winemaking: The grapes are destemmed and crushed with an estimated 90% to 95% berry maceration. Active dry Champagne 595 yeast at 2-lb/1,000 gal is added the same day as crushing.

Fermentation occurs in closed top fermenters with a maximum juice temperature of 85°F and maximum cap temperature of 90°F.

Utilizing a piston pump, the juice is pumped over three times/day for 40 minutes each.

Total skin contact time is eight to ten days, the length of the fermentation period.

When MLF completes in tank, 50ppm SO_2 is added. After the second racking, the wine goes to a mix of new to three-year-old, 60-gal French and American oak for 20 to 30 months. In barrel, free SO_2 levels are maintained at 30ppm free and approximately 80ppm total.

After 11 or 12 months, the wine is racked once with aeration.

The wine is not fined, but may receive a polish filtration before bottling in the second August or third January following harvest. At this time SO_2 levels are 30ppm to 35ppm free and 80ppm to 90ppm total. TA is 0.65 to 0.68 with a pH of 3.4 to 3.5. The wine is released nine to ten months after bottling.

Tasting Notes: 1987 St. Francis Winery Merlot

Color/Aroma: Red garnet and brick. Floral, vanilla, spice, sassafras, tropical fruit; cinnamon, spice, violets.

Flavors: Distinct and complementary to aromas; big wine with layers of fruit; cinnamon, nutmeg; cedar.

Balance/Finish: Lingering berry and barrel flavors; oak well-proportioned to fruit; integrated vanilla qualities; generous mouthfeel; solid, lengthy finish. ■

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MERLOT
Tying food & wine flavors together

By Eleanor & Ray Heald

"Food and wine work together in two ways," explains Gary Danko (chef de cuisine, Ritz Carlton Hotel, San Francisco, CA.) "There are similar components in the wine and similar components in the food that meet each other at a perfect balance."

For example, Danko offers a relationship by similarity by pairing a buttery Chardonnay with a buttery food component such as avocado, salmon, or a buttery sauce.

To illustrate two opposites coming together, he suggests an acidic Chardonnay with a salty oyster. The opposing flavors of sour and salt integrate to balance each other.

"Any chef knows that acid balances salt, and salt balances acid," Danko contends. "This is the basic element for making the food and the wine work together at the last minute before presentation."

Danko maintains that it takes both research and tasting experience to know which foods complement specific wines. In the following discussion, Danko applies the basic principles stated above to suggest food harmonies for Merlot.

Capitalizing on softness

"Merlot is basically a softer wine than Cabernet Sauvignon and has been used traditionally to soften Cabernet Sauvignon. Merlot has the ability to shed its astringency early, thus making the wine more drinkable in its youth. This aspect of the wine should be kept in mind when designing food complements for Merlot."

Danko explains that a chef could take a Chardonnay, a Merlot, or a Cabernet Sauvignon and make it complementary to veal. This is based upon the cut of the meat and the way it's prepared prior to cooking.

Illustrating with a veal loin, Danko first removed all the fat and connective tissue. "The point to make about fat is that when you have a very tannic red wine, you want to have more fat on the cut," he stresses. "In essence, the tannins cut through the fat to offer a better balance in the mouth. Since Merlot is not as tannic as Cabernet Sauvignon, the fat should be removed."

Danko rubbed the veal loin with a thin veil of mustard while cautioning about mustards in general. "I don't like raw mustard with wine," he emphasizes. "However, once mustard is heated, its character is changed and it becomes complementary."

Because one of Danko's preferred Merlot matches is hazelnuts, he rolled the loin in a combination of chopped hazelnuts, chopped parsley, and garlic, prior to roasting.

Carmelizing — an essential element

Danko stresses the second element of harmony — the method of cooking. "I carmelize the meat as much as possible," he says. "This process, which involves denaturing the natural sugars, brings the meat up to the character of the wine. It also relates to the sauce, which acts as the buffer between the meat and the wine."

The initial sauce preparation begins by deboning, cubing, and browning the meat from the belly flap of the loin. At this point, all the fat is drained off and veal stock is ladeled in. This is reduced to a glaze, reconstituted and reduced again about three to five times to achieve an essence with a natural dark color and savory beef flavor.

Danko advises using a veal stock for all reductions because of its high natural gelatin content. He uses breast bones and breast meat and cautions against a high proportion of onions and carrots in the preparation to avoid 'Dinty Moore beef stew' flavors.

Separately, a reduction is prepared from Merlot, chopped shallots, a bouquet garni (bay leaf, tarragon, thyme, and related aromatics). This reduction will be strained off and used to flavor the essence to the taste desired.

"With this example, it is the sauce with the carmelizing of the meat, that marries the dish to the wine," Danko says.

Precautions

"There are certain disadvantages to cooking with California red wines. The first is that they acquire a blue-violet hue when you heat them, and secondly, they are generally quite tannic. The latter is not the case with Merlot.

"The blue-violet hue can be dissipated with a powerfully brown essence and that's where care must be taken in the initial preparatory stages of the sauce."

As the vegetable complement to the roast veal loin, Danko chose eggplant, which he refers to as a 'flavor sponge'. The eggplant was oven-baked until it collapsed and then diced. Ginger, garlic, and soy were added to give it flavors complementing the meat and sauce.

"In general, Merlots have spicy aromatics and cherry fruit flavors," Danko continues. "The food preparation should reissue these characteristics in the mouth. Allspice, black pepper, and nutmeg are simple spice additions that showcase the basic aromas and flavors of Merlot."

To heighten the cherry theme, Danko suggests cooking sour cherries in Merlot with shallots, thyme, tarragon, and/or sweet basil and balancing the acid from the cherries with the acid of the wine. This could be added to an essence similar to the one described above and served to complement duck or pheasant.

Matches and mismatches

"Mild game dishes are my favorite matches," Danko says. "These run the gamut from game birds such as quail, squab, and pheasant, to venison.

"Contrary to popular opinion, venison, especially a luxury cut such as a loin, does not need a marinade unless you wish to cut the gamey character. Also, here's a case where the bluing effect of red wine is serious. A red wine attacks the myoglobins of the venison and causes the bluing.

Danko considers venison a winter food and pairs it with winter garnishes. For the sauce, he plumps dried currants in brandy. He then makes a reduction with chopped onions, shallots, Merlot, orange juice, and the currants, which is strained and integrated with the essence made from venison trimmings.

In discussing mismatches, Danko first speaks of mustard sauces. "The heat of the mustard overpowers the wine," he affirms. "But a thin veil like we used on the veal loin works well if it's rolled or coated.

"I've done the red wine and fish thing, but generally speaking, Merlot has enough tannin to keep this from harmonizing. However, if the sauce, for grilled salmon as an example, had sufficient fat, it might work well."

Danko emphasizes that not all salmon is the same, so to just say 'salmon' and make generalities from there is too simplistic. Some salmons are very fatty while others are moderate in fat content. The delicate flavors of Norwegian salmon make it easier to work with in terms of food and wine harmonies.

Salmon needs grilling to bring in the aspect of carmelizing again. The sauce needs to be adjusted to relate it to the elements of the particular Merlot, whether that be to use fruit for lighter-styled wines, or mushrooms and onions for a wine with more largess. If the Merlot is more herbal in character, good choices for sauce ingredients are chives, basil, tarragon, or green-flavored herbs.

"Merlot with plain grilled salmon is no match at all unless you use something like a soy marinade brushed on during grilling," Danko explains. "All skin should be removed from any type of salmon prior to grilling. The flavors of the skin do not match with wine and enhance an overly fishy character."

Cheeses, savories, and textures

Danko observes that a blue-veined cheese such as Roquefort makes Merlot taste metallic. However, a blue cheese such as Blue Castello or Saga Blue, that has large integrated sections of creamy cheese, works well. The increased proportion of high butterfat buffers the wine from the blue veins.

Savory courses are among Danko's favorites. For red wine in general, and more generously-styled Merlot in particular, he uses walnut bread because the tannins in walnuts relate well to the tannins in red wine. He oven-toasts the bread, spreads it liberally with Blue Castello cheese, mashes a very ripe fig on top, and returns it to the oven for brief warming.

Danko's focus on textures is unique. "When eating, audible elements have a hierarchy over the tastebuds and make pleasant distractions if used properly," he explains. "Croutons and crunchy nuts are examples. They add interesting components and are good distractors from high acid or tannic elements in red wines.

Maintaining control

"The basic principle is finding an ingredient to tie the flavors together," Danko concludes. "This is why it's important to work on the flavors of the vegetables and fruits through carmelizing, relating them to the wine on that level.

"It's also important to use wine, not vinegar, in the marinade. Acetic acid fights the acids in wine. Fruit acids are friendly to wine.

"In a busy restaurant, it's not always easy to control the food and wine pairings at the kitchen level. But when a chef can exercise control, it's necessary to pay attention to the basic principles we've discussed to enhance the dining experience." ■

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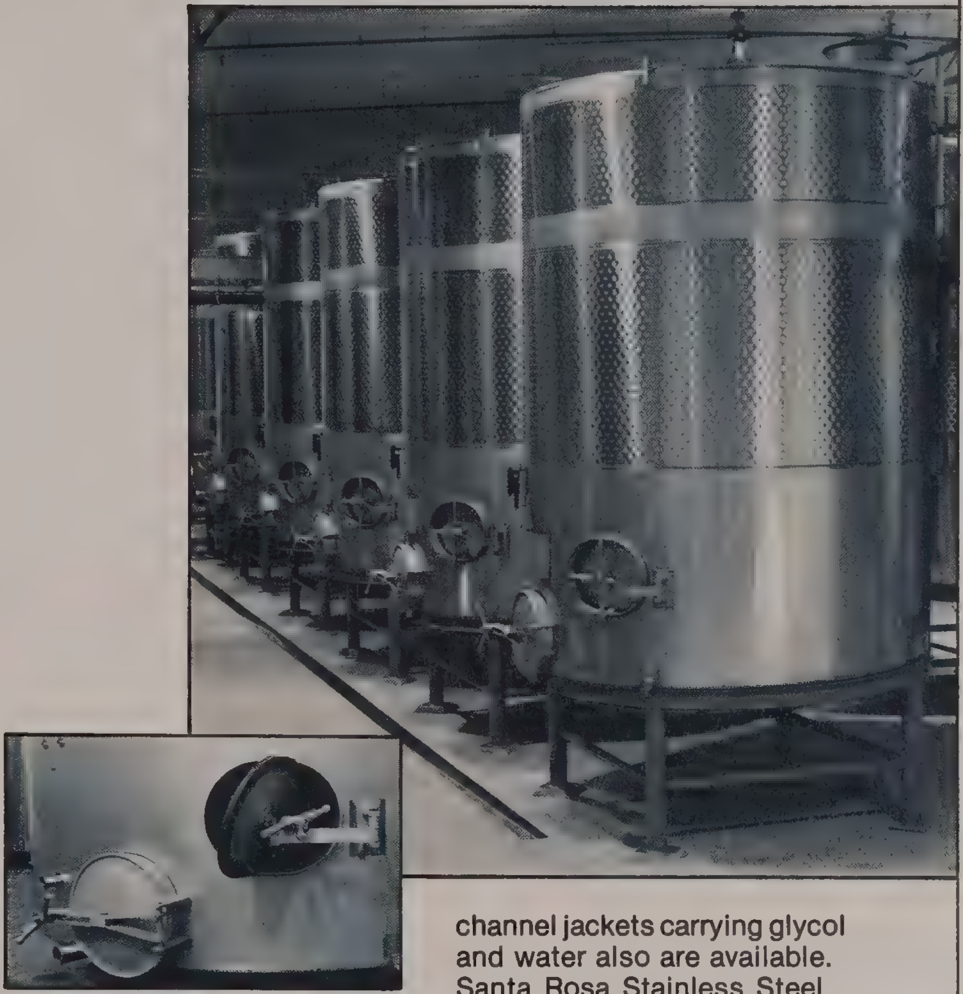

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Wines of Firestone Winery to be served at KCBX Vintage Dinner.

KCBX vintage dinner

Exemplary food/wine

By Eleanor & Ray Heald

The Central Coast Wine Classic, a benefit for KCBX-FM public radio in the San Luis Obispo, CA listening area, lives up to its name — Classic, when it comes to matching food and wine.

The three-day, weekend-long event in July, directed by Archie McLaren, Jr., includes a wine auction on Saturday followed by a Vintage Dinner that evening for 450 people at the Embassy Suites Hotel in San Luis Obispo.

The evening commences with a California sparkling wine extravaganza and appropriate finger-food appetizers. The dinner format is simple and well-organized. A sponsoring winery hosts a table of ten people. A winery owner or winemaker is present to discuss the wines served with each course. One KCBX volunteer acts as wine steward for two tables.

A winery may choose to serve one or two wines per course. The recommended guide for service is 1 to 1½ bottles of wine per person for the evening or three 750mL bottles per course.

Five executive chefs from San Luis Obispo County restaurants each plan one of the meal's five courses. They take exceptional care to design a menu that complements the broad range of wines presented by the participating wineries. The menu is mailed to wineries two weeks in advance so that appropriate wine and food harmonies can be devised.

Logistics

Prior to serving the meal, the wine steward reconfirms the order of service with the table host. If a sponsoring winery does not produce a full line of wines, they frequently serve an appropriate wine from a neighboring vintner in the effort of showcasing regional wines.

Dinner begins with a white wine course balanced to accompany an array of wines, including a sparkling wine, Chardonnay, Sauvignon blanc, or Gewürztraminer. A light red wine course, which may be soup, is served next, followed by a fuller-bodied red wine course. The salad is served after the entree and followed by dessert.

Kitchen organization includes four preparation lines to facilitate serving each menu item within 12 to 15 minutes.

The fundamental, wine-compatible menu model emphasizes natural, local products; downplays pepper and hot spices; and dictates light use of wine in sauces, to keep them delicate. Dessert is light, to harmonize with either dessert wines or sparkling wines.

Within these parameters, participating chefs imprint their individual style preferences on their respective course.

Creating one harmony

"The Central Coast has a variety of producers and wine styles," comments Serge Ouattara, Executive Chef at the Inn at Morro Bay. "My cooking style is French-influenced with an Italian flair, but in designing the salad course for the 1990 Vintage Dinner, I concentrated on the unique aspects of this region and attempted presentation of a salad to complement wine. It was not my intention to offer a palate-cleanser course prior to dessert."

Using local greens (available year-round) Ouattara prepared Exotic Salad Leaves, Local Berries, and Citrus with Balsamic Lime Vinaigrette, in conjunction with a fruit terrine made from local berries.

"Sparkling wine, orange juice, and a touch of Grand Marnier in the terrine heightens natural citrus and fresh, crisp characteristics of white wine," Ouattara maintains.

"Balsamic vinegar, used judiciously, works well with wine in general. It's aged in wood and complements a broad spectrum of wines, from generously fruity to more complex.

"In combination with lime juice and olive oil in a vinaigrette, balsamic vinegar doesn't heighten the tannins of a red wine. Together with the bright berry fruit in the terrine, it accents generous fruit components of the region's Chardonnays, Cabernets, and Merlots."

Bravo to the Central Coast Wine Classic for a unique blending of personalities — wine, chefs, and cuisine! ■

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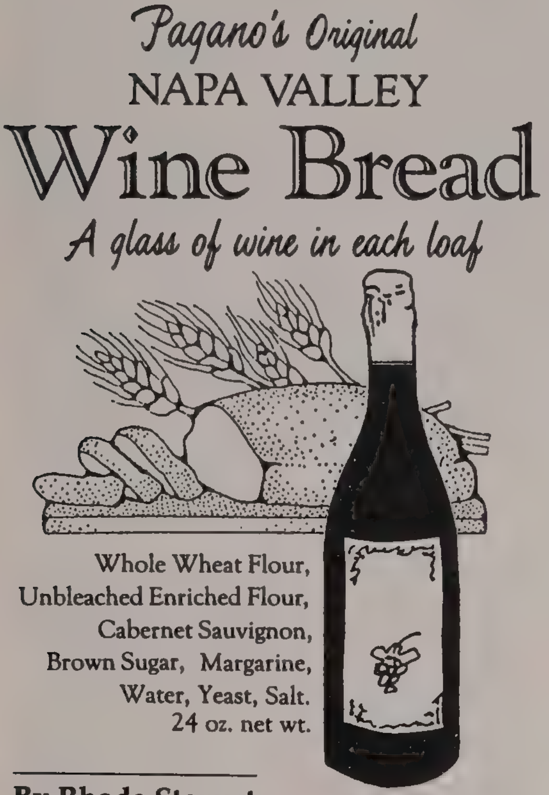
Loafing with wine



By Rhoda Stewart

A few years ago, Steven Sullivan, owner of Acme Bread, Berkeley, CA, was sitting around with some friends one evening while in France, and the subject of breadmaking came up.

Before the evening was over, Sullivan had come upon the idea of creating a sourdough starter by crushing some ripe wine grapes, mixing the juice with water and flour, then allowing it to ferment, creating a natural yeast starter. It worked, and the bread he made from this starter he called Pan Au Le Vin.

Sullivan's recipe has since become a part of ***The Chez Panise Cookbook***. Today, at least one other bakery in northern California, Lotus Bakery, Santa Rosa, makes a Pan Au Le Vin from the recipe. Using organically-grown wine grapes to create the starter, and all organic ingredients, Lotus Bakery named its chewy whole wheat baguette Organic Le Vin.

A former winery worker has taken wine a step farther in the bread-making process. Since June, 1989, Sal Pagano of Napa, CA, has been producing flavorful, hearty wheat breads and rolls from his original recipe that uses wine as the only liquid. Rose-hued and slightly sweet, the breads offer an inviting aroma and a sequence of taste experiences much as a fine glass of wine does.

"First, you notice the hearty wheat flour," says Pagano. "As you continue chewing, a light sweetness surprises you. After chewing a bit more, and swallowing, your palate is left with a slight tart finish — the subtle calling card of the Petite Syrah wine I currently use. If this is your first taste, the realization hits: there really is wine in this bread!"

Pagano was struck with the idea for the combination of these two old favorites one afternoon while working for De Moor Winery. He had just inoculated some Cabernet Sauvignon must to initiate fermentation when it occurred to him to combine the inoculated juice with flour, sugar, and salt, and bake it — which he did that evening.

Pagano liked the result, and took some loaves to the winery the next day, where it was eaten with great enjoyment. Inspired and encouraged, he embarked on an eight-month adventure to develop a large quantity recipe using wine rather than the unfermented, innoculated Cabernet Sauvignon, as he did in his experimental loaves while with De Moor.

The greatest obstacle was finding a way to unite the alcohol in the wine with the yeast so that the alcohol didn't kill the yeast before it had a chance to leaven the dough.

The first attempts yielded biscuits rather than bread. However, by experimenting, both with types of yeast and methods of combining it with wine, this obstacle was overcome.

The second difficulty was to develop a blend of whole wheat and unbleached white flours that would create a hearty loaf that wasn't dense and heavy.

Once Pagano solved this problem and was able to consistently produce a product that a growing number of customers liked, he looked for a supply of wine to meet the demand for the bread. Any robust dry red table wine with 12% to 14% alcohol will adapt nicely, especially rough, tannic wines not up to the standard of high-end reds.

Although Pagano's first product was made with Cabernet Sauvignon, he later located a 900-gallon supply (about one year's worth) of Petite Syrah. The wine is

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stored in barrels in a humidified refrigerated warehouse, where he can monitor its health himself, based on three years experience as a cellar worker.

The bread contains 8-oz. of Petite Syrah per 24-oz. loaf — thus his slogan, "A glass of wine in every loaf." The current dough recipe calls for whole wheat flour, unbleached white flour, margarine, yeast, salt, brown sugar, and Petite Syrah.

Buttercream Bakery, in Napa, bakes the bread, labeled "Pagano's Original Napa Valley Wine Bread." About 300 lbs. of dough is baked weekly into 24-oz. loaves, 10-oz. mini-loaves, dinner rolls, and 6-oz. sandwich rolls.

The bread contains no preservatives; yet it has a shelf life, at normal room temperature, of about two weeks. The long shelf life surprised Pagano, as his other baked products had a room temperature shelf life of only three to four days. Since wine is the only variable, he has concluded that wine contributes greatly toward maintaining the freshness of Napa Valley Wine Bread.

Since bread, like wine, is a timeless product, a flavorful recipe will always have an appreciative consumer awaiting it. Pagano takes advantage of this natural goodwill.

"This business is about building relationships," says Pagano. "Any time I'm servicing accounts, giving 'new product' demonstrations at the places that sell the breads, or being hailed by customers who recognize my van on the street, I show my customers I appreciate them.

"I enjoy the bread. I've enjoyed creating it. I eat it every day. I enjoy sharing it with anyone who enjoys good bread." Pagano likes customer relations so much, in fact, that he still personally delivers to a few favorite accounts.

The goodwill is paying off. In 1990, Pagano incurred about $15,000 in expenses, and grossed about $10,000. He has been able to pay the bills when they come due. The business, now in its second year, is self-supporting.

A new second-generation wrapper with an Art Deco look has been designed. The clear wrapper has white stripes running its length. The label has an illustration of a partially-sliced loaf of bread, a few heads of wheat, and a bottle of red wine.

Pagano is a student at Sonoma State University, working towards an elementary school credential, and is a regular substitute teacher (at about $70/day) in Napa Unified School District. He is not being supported by the bread business; he draws no salary.

Although his career interest is as a public school teacher, Pagano also hopes to see the bread business go national — if not international. He would especially like to see wineries produce a wine bread from the recipe using their own red wines, with their winery logos on the packages along with his label.

"The recipe is ideally suited to local production by any winery, or anyone with a source of wine," says Pagano.

Today, Pagano's Original Napa Valley Wine Bread is available in Napa's Vallergas stores, in Northern California Safeway stores, at the Napa Valley Wine Train Station gift shop, Sonoma Cheese Company, and a few local winery delis. And tomorrow? If Pagano's dreams come true, any place in the world where wine is made. ■

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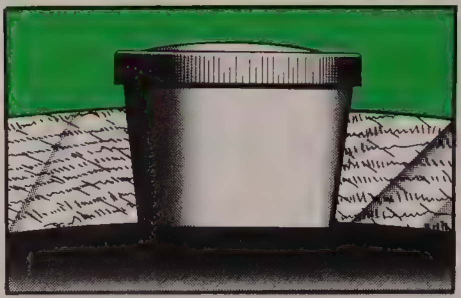

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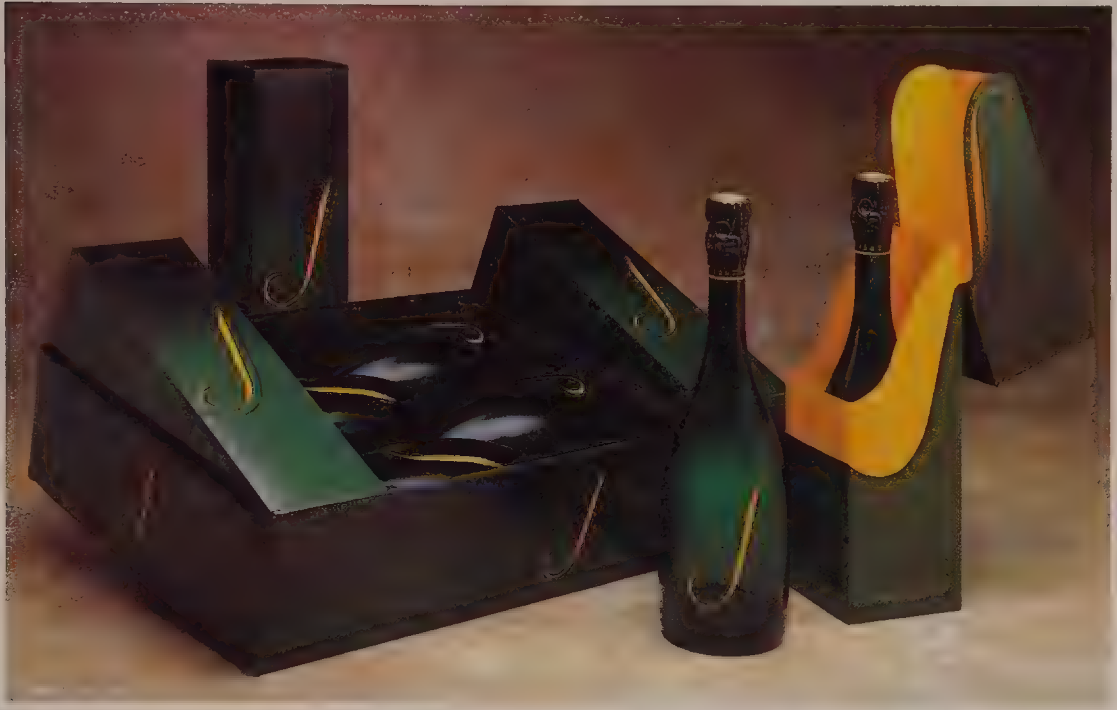
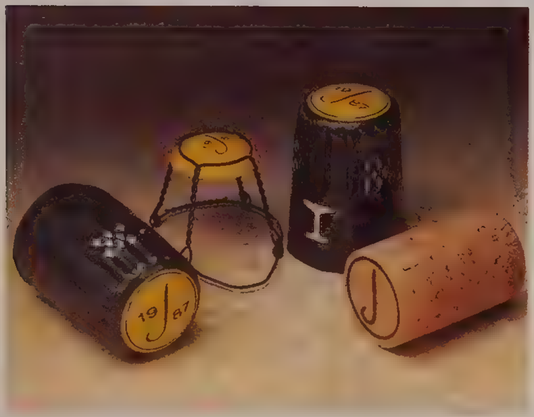




TOP LEFT: 'J' bottle, gift carton, and shipper. TOP RIGHT: 20-spout SCOMA gravity filler (80 bpm capacity). LOWER LEFT: Cork, wirehood, and capsule supplied by Cork & Seal Cebal. LOWER RIGHT: Ten-piece bottling line supplied by Cork & Seal Cebal includes: Champagel bottle-neck freezer (custom-made for 'J' bottles), SCOMA filler, Valentin biduler/crown capper monoblock, T.D.D. disgorging/dosage monoblock, Valentin corker/wire hooder monoblock fed by Valentin cork orienter/dispenser, Valentin agitator, Stentz bottle washer, Kosme labeler, Pierlot pleater/crimper, all connected by Thierion conveyors.

New J-sparkler has unique package

By Millie Howie

"It's a tough time in the wine market, but an exciting time, and we've got a terrific product and package that is going to thrill people," says Judy Jordan about their new 'J' sparkling wine. Judy and her father, Tom, own Jordan Sparkling Wine Company, Healdsburg, CA.

Jordan will produce just one sparkling wine, a Brut, in the 'over-$20' price bracket. Vintage-dated, the grapes come from vineyards in Sonoma County. With a nearly equal blend of Chardonnay and Pinot Noir grapes, distribution of the wine will be almost evenly divided between retail and restaurants all over the U.S.

But the packaging is as interesting a story as the wine. "The packaging must be special on the shelf, on the table, in an ice bucket, when poured, and upside down in the bucket when the bottle is empty," says Judy. "It has to say, 'this is a different product.' " To design the package, the Jordans called Ralph Colonna, Colonna, Farrell Design Associates, St. Helena, CA.

Work on the 'J' project began in October 1985, and the first bottle manufactured was in July 1987. Harley Conner, President of Jordan Sparkling Wine Co., coordinated the project since the beginning.

They started with the bottle. Tom Jordan wanted an exclusive shape that was their own. "Dad looked at all the European bottles, and bought one of every kind he could find," recalls Judy Jordan. Then Demptos Glass Corporation, Napa, CA, was called in by Ralph Colonna on the project.

"One of the first things we did," says Patricia Rotshuizen, Demptos Marketing Director, "was develop a technical blueprint of all the design features. Then we went to the sources to see if it was technically feasible. We had to guarantee it was proprietary, and would not conflict with any existing mold.

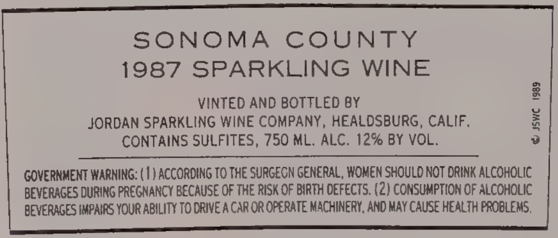
"The bottle standards set by Jordan were very strict." The long, narrow neck must be constantly checked to be sure each bottle has the minimum inside diameter to admit the filling spout. The punt was designed so that the top of one bottle fits neatly inside the punt of the next for storage in the riddling bins.

The glass color is champagne green with ultraviolet light protection. The color has a narrow upper and lower range of tint, so all bottles will be consistent.

The 'J' is a Windsor Yellow glass enamel, made of powdered glass mixed with a chemical liquid, applied through a thin screen, baked on, and fired. This assures that the letter is permanently on the bottle. Unlike an ink application, it cannot be scraped off, even with a knife.

The firing is necessary to anneal the 'J' to the bottle. This burns off the 'cold end treatment' that is applied in glass production as a protection from scratching during transport. The treatment must be reapplied after the decoration is fired.

Dressing the bottle is a slotted, tin-lead capsule supplied by Cork & Seal/Cebal, Vallejo, CA. The wire eye of the wirehood (also supplied by Cork & Seal), is accessible outside the capsule so that the neck strip remains intact when the hood is removed. The neck strip has a pattern of Js and the vintage date, with the year lined up with the 'J' on the bottle face.



SONOMA COUNTY
1987 SPARKLING WINE

VINTED AND BOTTLED BY
JORDAN SPARKLING WINE COMPANY, HEALDSBURG, CALIF.
CONTAINS SULFITES, 750 ML. ALC. 12% BY VOL.

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GOVERNMENT WARNING: (1) ACCORDING TO THE SURGEON GENERAL, WOMEN SHOULD NOT DRINK ALCOHOLIC BEVERAGES DURING PREGNANCY BECAUSE OF THE RISK OF BIRTH DEFECTS. (2) CONSUMPTION OF ALCOHOLIC BEVERAGES IMPAIRS YOUR ABILITY TO DRIVE A CAR OR OPERATE MACHINERY, AND MAY CAUSE HEALTH PROBLEMS.

Cameo Crafts, Montreal, Canada, supplied (through their facilities in Milton, VT) the printed laminated foil sub-strat on the neckstrip and the back label.

The 'J' sparkler is transported in a shipper called a 'J-Pac,' designed to hold six bottles. Four bottles are nested in a cradle insert, with ¼-inch separation, in the center of the shipper. Cross-wise, at each end of the shipper is a bottle in a gift carton.

The 72-inch long, die-cut cradle insert, is folded, rather than glue-laminated, which actually saves money. Everything is printed; there is no exposed kraft board. The insert is printed gunmetal grey plus varnish on both sides.

The outer shipper is a RSC 250-lb. single-wall slotted case, printed in metallic colors: Windsor Yellow, green, and gunmetal grey, plus varnish, provided by Mark Container Corporation, San Leandro, CA. For additional protection, there is a flat pad of 200-lb. single-wall board, printed gunmetal grey on both sides plus varnish. A 'J' is printed on each side of the shipper, and the back panel. The mandatory government wording is screened onto the opposite end in yellow.

Greg Gale, of Mark Container, executed turn-key production on the J-Pac including design, package engineering, printing, lamination, die-cutting, fabrication, collating and assembly.

The 'J' gift carton, designed by Ralph Colonna and production coordinated by Mark Container, is made with 28-pt. board to provide a near rigid box feel, and has a flip-top. As the carton faces the consumer, there is a die-cut 'J' on the front face, paralleling the break-line of the hinged carton. The outer sleeve is four-color process printed plus varnish on the outside, and Windsor Yellow inside. Ivy Hill Packaging, Los Angeles, CA, printed and fabricated the cartons.

At the packaging stage, bottles are put into gift cartons which are sealed with a gold foil seal.

The 'J', aside from its obvious position as the capital letter of the name, Jordan, was selected because, says Colonna, "It is one of the few letters in the alphabet you can play with. It is long and elegant, and because that elegance matched the wine, it was an appropriate choice."

The brushed look of the letter, giving a feel of California casual, is credited to Tom Jordan. "We wanted to make sure the bottle gave the impression that the wine was fine enough to be enjoyed at formal ceremonies and casual enough for spontaneous moments," says Judy.

The first release, vintage 1987, is being distributed across the U.S. It is on allocation, since production was only about 12,000 cases. ■

More information is available from:

Bottles—**Demptos Glass Corp.**, 860 Latour Ct. Suite D, Napa, CA 94558, tel: 707/252-7688, fax: 707/252-3437.

Bottling equipment, capsules, corks, wirehoods—**Cork & Seal Cebal**, 5425 Napa-Vallejo Hwy, Vallejo, CA 94589, tel: 707/257-6481, fax: 707/257-8028.

Package design—**Colonna Farrell Design**, 1335 Main St., St. Helena, CA 94574, tel: 707/963-2077.

Package manufacture—**Mark Container Corp.**, 1951 Williams St., San Leandro, CA 94577, tel: 415/352-2661, fax: 415/352-8976.

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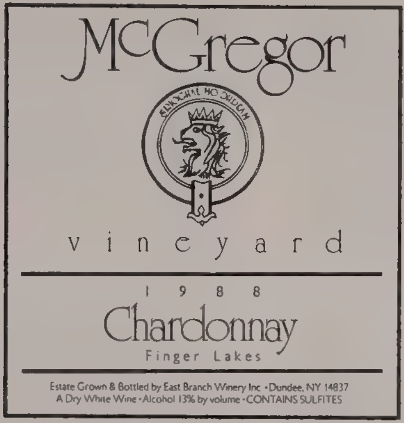
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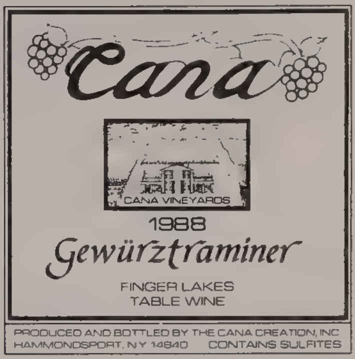
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CANA VINEYARDS
1988
Gewürztraminer
FINGER LAKES
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HAMMONDSPORT, NY 14840 CONTAINS SULFITES

By Thomas Pellechia

The mood was festive at the annual Keuka Lake Winery Route Association brunch held in 1990. For the first time since its inception in 1985, the Keuka Lake group, in the Finger Lakes region of New York state, had money in the bank to carry over to the next summer tourist season.

Winery owners talked about the increase in tasting room sales. "I know," said treasurer Willy Frank, of Vinifera Wine Cellars, "that our increase in sales and tasting room traffic results from the work of the association."

"It took a lot of hard work to get the Keuka Winery Route to where it is today," echoed Joyce Hunt, association President. "The increased customer traffic at Hunt Country Vineyards' tasting room proves to me the success of our six wineries working together."

The six wineries produce mostly vinifera and French-American hybrid wines. All six produce Riesling and Chardonnay. Three wineries, Cana, McGregor, and Vinifera Wine Cellars, produce Gewürztraminer. McGregor and Vinifera Wine Cellars produce Pinot Noir, and Vinifera Wine Cellars produces only vinifera wines.

Five wineries offer Seyval and Vignoles, among other French-American hybrids, either as varietals or in proprietary blends. Hunt Country produces one wine that includes labrusca in the blend.

The wineries sell most of the wine within the region and at the tasting rooms. Many times, visitors are served by the owner, who may be the winemaker.

Farm wineries in New York

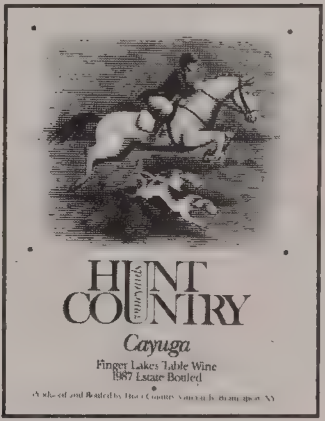
New York farm wineries are the result of the 1976 Farm Winery Act which removed the bureaucratic boundaries and expensive licensing fees that made it virtually impossible to start a small winery. Before such legislation, a dozen wineries existed in New York and today, there are nearly 100.

To be licensed in New York state as a farm winery, annual production cannot exceed 150,000 gallons. By that standard, the Keuka Lake wineries are small, indeed. Heron Hill Vineyards, the largest, produces 37,000 gallons; Vinifera Wine Cellars, 17,000-gal; McGregor Vineyards, 13,000-gal; Hunt Country Vineyards, 8,000-gal; Keuka Spring Vineyards, 3,500-gal. The smallest, Cana Vineyards Winery, produces and sells almost all of 2,500 gallons on premises.

Many owners are fiercely independent people who do not easily join a cooperative effort. They are grapegrowers who tired of falling grape prices paid by two or three giant wineries. Or they are transplants to the area, entrepreneurs, whose love of the grape made them give up city careers.

Although legislation made it easier to start small wineries, it did nothing to promote or sell wine. The owners quickly learned how difficult that can be.

Early in 1985, the wineries on Keuka Lake reluctantly held a meeting to determine if they should join together to promote their wine district. Anne Kiley at Cana Vineyards remembers, "There were a few false starts, some problems were ironed out, and after three meetings, we created an association in March, 1985. We did not fully agree on the direction to take, but agreed on one thing — that by working together we could save money and increase our visibility."



Dr. Konstantin Frank
1988
Pinot Noir
NEW YORK FINGER LAKES
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HAMMONDSPORT, N Y 14840. ALCOHOL 12.5% BY VOLUME
CONTAINS SULFITES

Heron Hill
Finger Lakes
White Table Wine
PRODUCED AND BOTTLED BY HERON HILL VINEYARDS, INC
HAMMONDSPORT, NY 14840 CONTAINS SULFITES

KSV
1986
Keuka Spring
Chardonnay
Finger Lakes
A Dry White Wine • Alcohol 13% by volume.
Produced & Bottled by Keuka Spring Cellars, Branchport, N.Y.
Contains a Sulfiting Agent

Also in 1985, the legislature, responding once again to problems within the grape and wine industry, created the New York Wine & Grape Foundation. "Its mandate was to revive the grape and wine industry economically," says Jim Tresize, Foundation President, "and to encourage cooperation within the industry by centralizing promotion and research.

"State money could be allotted as matching funds. The idea was to form a partnership between the state and the industry — the state matches money put up by the industry."

By uniting together, Keuka Lake wineries proved to the foundation board that cooperation was their primary goal. A $20,000 budget was approved in 1986 to create a joint brochure and erect distinctive direction signs around the winery route. The foundation matched the association's contribution dollar-for-dollar.

Keuka Lake winery promotion

Peter Johnstone, of Heron Hill, was the driving force behind completion of a 4-color brochure. "We wanted to draw more visitors to the area. The group agreed that the best way to start was to

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present a quality image of the area and the wineries."

For the first two years, the brochure and a few road signs promoted the wineries. Eventually, three wineries felt more was needed. In 1987, Cana, Hunt, and McGregor applied to the foundation for additional funds to create a series of special events for the 1988 tourist season. The foundation paid 75% of the $8,000 budget to promote three Saturday events.

The first event, a barrel tasting, was held in May, 1988. Upon visiting the first winery, tasters paid $5/person and received a souvenir wine glass, (etched with the foundation's Uncork New York logo). A sample of a new 1987 vintage wine from barrel was offered in addition to two bottled wines and a snack.

Visitors then took their glass to the other two wineries, to taste more barrel samples, finished wines, and snacks.

Almost 200 people visited the wineries, a significant increase of visitors in May, which is not a very busy month at Finger Lakes winery tasting rooms.

The weekend of the barrel tasting produced the best sales figures of the month at each winery. Anne Kiley, at Cana, responsible for promoting the event, used simple and inexpensive advertising techniques: combining all winery mailing lists for a direct mail flyer and sending press releases to over 100 publications.

Heritage Day, the second event, was held during the July 4th weekend. For $7.50/person, visitors received a souvenir wine glass, food samples reflecting the winery owners' ethnic backgrounds and tasted three wines that complemented the food items. About 200 visitors attended.

The ticket price was increased to cover food costs. Wine sales were not as good as at the barrel tasting but each winery did report better sales than non-event weekends for July.

The last 1988 event was held in August. A $5 ticket entitled each visitor to a wine glass and samples of two New York state cheeses with crackers, and three wines at each winery. Turnout surpassed 200 and wine sales were brisk.

"We began to recognize many of the faces of visitors who collected the glasses, and our wines," says Kiley. "We started building a computerized mailing list of those visitors who attended special events."

Marge McGregor, at McGregor Vineyards, remembers, "It was difficult, originally, to persuade the other wineries to join in the events. But when we showed them our success in 1988, we proved that working together was beneficial.

"Many visitors appreciated that the wineries were cooperating to offer these enjoyable afternoons. Over and over, visitors told us that they would much rather visit a wine district that had lots of variety to offer."

Expanded variety

In 1989, Heron Hill Vineyards, Keuka Spring Vineyards, and Vinifera Wine Cellars joined the other three wineries to host events. The foundation provided 50% matching funds to cover a second printing of the brochure and additional road signs. The six wineries put in enough money to produce and mail press releases and event flyers to previous visitors on the computerized mailing list.

Besides the above events, a holiday event was added in November, 1989, when most Finger Lakes tasting rooms have closed for the winter. The new event was to put visitors into a buying spirit for the coming Thanksgiving and Christmas seasons.

Hunt Country Vineyards hosted Santa Claus. Cana Vineyards provided mulled wine, popcorn, and ginger snaps, served around a Christmas tree. All the wineries were decorated and offered gift items reflecting the holiday season.

All four 1989 events were sales successes for each winery. Some wineries reported an increase as high as 35% for the summer season. Sales during the barrel tasting and holiday events surpassed normal weekend sales by as much as 100%. The number of visitors rose from an average of 200 to about 275/event.

In 1990, each event was extended from Saturday-only to a full weekend. The Keuka Lake Winery Route brochure was incorporated into a brochure produced by the Wine Country Tourism Association, an organization of businesses and area attractions on Keuka Lake. The group includes restaurants, accommodations, two museums, two tour boats, merchants, and the wineries.

A two-day harvest festival in September brought together all the members of Wine Country Tourism and the Keuka Lake Winery Route. The weekend began with a blessing of the harvest at one vineyard.

Food specially prepared from ingredients harvested that weekend was available at all participating restaurants. Special rates for each museum and tour boat attraction were offered during the weekend. On Sunday, one tour boat held a wine tasting during a 3-hour cruise. Other festivities included a grape pie contest, music, and grape crafts.

In 1990, visitors averaged 300/weekend and sales jumped as much as 75% at some tasting rooms. The mailing list grew to 3,500. The association reduced printing and mailing costs by printing one ticket for all five events and by mailing postcard reminders in place of more expensive flyers.

For the 1991 tourist season the Keuka Lake Winery Route joined once again with the Wine Country Tourism Association and added a new event, in late April. Members of the press were invited to spend a weekend on the route where they met the winery owners as well as owners of area restaurants, accommodations, and attractions. Participants in the event donated their food, rooms, and facilities, as well as wine.

The annual barrel tasting, held the first weekend in May, kicked off the tourist season. In addition to paying for 1991 events, funding was used to produce a promotional poster that is provided free to all retailers and restaurateurs in New York state. Also, items that promote the winery route, such as a new Keuka Lake Winery cookbook, are being sold in each tasting room.

Foundation for success

The New York Wine & Grape Foundation has spent many dollars on promotion. Still, not all programs meet with approval from small wineries. A poll of the six Keuka wineries points to a lack of consensus regarding the effectiveness of programs aimed at New York City retailers, or the short lived wine-by-the-glass program in restaurants.

But all Keuka winery members agree on one thing: foundation funding was instrumental in making their association successful. Judy Wiltberger of Keuka Spring Vineyards says, "The single most important benefit small wineries receive from the foundation is funding for special events."

Although funding for the Wine and Grape Foundation has been reduced by the fiscally strapped New York legislature, funds for the winery route are available at least for one more year.

Spirits are high for the coming season on Keuka Lake, and the level of cooperation has never been higher. The wineries, expecting foundation funding to dry up, are hoping this year goes a long way toward making the Keuka Lake Winery Route self sufficient. ■

PART II

Lighting for the winery

By Ken Arthur, P.E.
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In Part I (**PWV** - May/June 1990), we discussed the need for good lighting in the winery, why 'see-ability' is important in the workplace; why ultraviolet emissions of artificial light sources may be of concern to the winemaker, and how HID (High Intensity Discharge) light sources work.

What is fun and challenging for a consultant to the wine industry is that virtually every winemaker has an opinion about lighting — what you like, what you do not like, how much, how little, and what kind make for a long list.

Lighting is an emotional experience. However, in many instances, emotion is set aside and cost becomes the factor determining the lighting system installed in the processing areas of a winery. In my 23+ years of involvement in the wine industry, cheap lighting is the most common error made in the winery physical plant.

Below, I will explain some additional lighting 'jargon', review the types and capabilities of fluorescent and HID light sources, study wet versus damp location environments that light fixtures are required to work in, and discuss how ambient temperature affects light fixture choice. We will also explore fixture types in terms of quality, efficiency, and maintenance.

Lighting terminology

When you are looking for a lamp type and a fixture to put it into, you will encounter some terms that it is helpful to understand.

Lamp efficacy — 'Lumens' is the measure of light output. Divide the lumens by the lamps wattage (power) consumption and you have LPW (lumens per watt). It is a simple way to compare the efficiency of different light sources.

For example: a 100-watt general service incandesent lamp has an initial light output of 1,750 lumens. Dividing 100 watts into 1,750 lumens yields a lamp efficacy of 17.5 lumens per watt (read 17.5 LPW). A 100-watt High Pressure Sodium (HPS) lamp has an initial light output of 5,200 lumens translating to 52 LPW or roughly three times the light output for the same lamp wattage. LPW quantifys a lamp's 'luminous efficiency', an important consideration when selecting a light source.

Lumen maintenance — This is a physical characteristic of each lamp type and wattage. The light output of each type of lamp will deteriorate over time. Lighting catalogs will list both an 'initial' lumen output and a 'mean' lumen output, *i.e.*, the light output at the time the lamp is put into service (initial) and the light output at some percentage of the lamp's rated life (mean).

Rated lamp life — A very misunderstood term, this is really a statistical average. All lamps are given a rated life expressed in the number of hours at which it is expected that 50% of a group of them is likely to fail. This is important to know, since it relates directly to lighting maintenance costs.

In the example above, *i.e.*, using a 100-watt incandescent lamp versus a 100-watt HPS lamp, we again have a significant disparity. The 100-watt incandescent has a 'rated life' of 750 hours. The 100-watt HPS lamp has a 'rated life' of 24,000+ hours.

Assuming a burning time of 10 hours/day, at least 50% of a group of incandescent lamps would have a 75-day (about 2.5 months) life expectancy versus 2,400 days (about 6.5 years) for a group of HPS lamps of the same wattage.

Yes, the HPS lamp and fixture are initially more expensive. However, lamp replacement, the labor to replace the lamp, and the energy cost savings make the HPS light source considerably less expensive to 'own' than the incandescent light source.

Chromaticity — This is a measure of a light source's coolness or warmth expressed in degrees Kelvin. Typically, the scale runs from 2,000K to 7,000K. Chromaticity ratings of 3,000K or less are considered 'warm'. Those in the 3,500K range are considered 'neutral' or 'balanced'. Those 4,000K and higher are considered 'cool'. This is a convenient way of comparing lamp types when color rendition is a factor in the selection of the light source.

Color Rendering Index (CRI) — The color rendering index is also very helpful in determining the 'effect' a light source will have on the colors of objects. With a maximum index rating of 100, light sources with a CRI of 80[1] are considered very good at showing the object being illuminated as 'natural' or 'familiar'.

Lamp review

Flourescent — Flourescent lamps produce light by passing current through a low-pressure vapor or gas contained in a glass tube. Tubular fluorescent lamps range in size from 5/8 to 2.5 inches in diameter and are designated by the letter 'T' (indicating the tubular shape of the lamp), followed by a number that is the diameter of the tube in eighths of an inch.

The new T8 lamps are exactly 1-inch in diameter. The older T12 lamps are 1½-inch. Fluorescent lamps with a CRI up to 90 (excellent color rendition) and chromaticities from about 2,700 to 6,300K are readily available in the marketplace.

High Intensity Discharge lamps (HID) — This family of light sources consists of mercury-vapor (MV), metal-halide (MH) and high-pressure-sodium (HPS). These were discussed in Part I, but there are a few additional details you should be aware of when selecting one of these light sources.

In my opinion, mercury-vapor in a winery environment is inferior to a MH or a HPS lamp, so I will limit this discussion to the MH and the HPS sources.

Metal-Halide (MH) — This source is available in lamp rating from 32 to 1,500 watts. It can be purchased in clear and coated versions. Except for some uses in visitor areas, the clear lamp is usually the best choice because it will allow the fixture to provide the best optical control.

MH is usually considered for those applications where color rendition is important, such as warehouses where label color identification is important for quick selection. Some winemakers prefer them in bottling areas (see "ultraviolet emissions" in Part I) and some wineries prefer them in the crush area for better nighttime inspection of the incoming fruit.

The MH lamp has a CRI of between 50 and 90 (the highest in the HID family of lamps), a high efficacy — up to about 95 LPW initial — and a relatively long life expectancy that varies with the lamp wattage (6,000 to 24,000 hours rated life).

This lamp also has some serious shortcomings that can limit its use for winery applications. Its initial warm-up time (from a cold start) is three to five minutes. The lamp re-strike time, from a momentary power failure, is 10 to 15 minutes. This characteristic requires that you seriously consider where you use this light source.

For example, if you wish to use it to light the catwalk and work area on the top of your wine storage tanks, you have to turn the lights on five minutes before you want to go there. Or, if you are up there and there is a momentary power failure, it will be as much as 15 minutes before they come on again and reach full output. In these situations, many wineries just leave them on all night when there is tank activity.

Another characteristic of the MH light source is its shift in apparent color temperature. Typically, this lamp type will shift its color spectrum by 1,000K or more over its rated life, generally toward a cooler chromaticity. If you walk into any installation where MH lamps have been in use for several years, the color output differences from lamp to lamp are quite noticeable.

During the first 100 hours or so, after a new MH lamp is put into service, the chromaticity (color temperature) will shift until it becomes fairly stable. During this period, some people find this shifting color temperature to be very annoying while others are not aware of it at all.

Normal variations in supply voltage, the lamp's burning position (vertical, horizontal, inbetween), and fixture ballast characteristics can also effect both the lamp color and its efficacy.

High-Pressure-Sodium (HPS) — This source is available in lamp ratings from 35 to 1,000 watts. The standard lamps have an average rated life of 24,000+ hours and maintain the light output well (90% mean lumens over the lamp life), in many of its wattage ratings.

Generally, the lamp has a poor CRI, typically ranging between 20 and 30. The deluxe HPS lamps will yield a CRI of about 65 and a new series of 'white' HPS lamps has recently been introduced in the 35, 50, and 100-watt ratings that have a color temperature about 2,800K and a 70 CRI with no color shift, over their rated life.

Manufacturers suggest that these more color-corrected lamps have a shorter rated life expectancy of about 10,000 hours. Compared to an incandescent in the same application, a 100-watt HPS lamp will have 3X more light output and 13X longer life expectancy.

In my opinion, there are few applications in the winery process areas, both indoor and out, that are not suitable for the HPS light source. Its efficacy is the highest of the HID light sources (up to 120 LPW), making it the most economical to own over a period of time. Its color output has a warming effect in stainless tank areas and looks wonderful (my opinion, of course) on wood tanks, barrels, and wood-finished areas.

Damp vs. wet locations

One of the most common errors made in winery process areas is selecting a fixture type that is incorrect for the operating environment. The National Electrical Code (NEC) defines wet and damp locations for the installation of electrical equipment. The Code requries that electrical equipment be designed and listed for wet and damp locations.

The NEC defines 'fixture locations'[1] as follows:

a) Wet and damp locations: "Fixtures installed in wet or damp locations shall be so installed that water cannot enter or accumulate in wiring compartments, lampholders, or other electrical parts. All fixtures installed in wet locations shall be marked, 'Suitable for wet locations'. All fixtures installed in damp locations shall be marked, 'Suitable for wet locations' or 'Suitable for damp locations'.

Underground installations, those in concrete slabs or masonry in direct contact with the earth, locations exposed to weather, vehicle washing areas, and like locations, shall be considered to be wet locations with respect to the above requirements.

Interior locations protected from the weather but subject to moderate degrees of moisture, such as basements, barns, cold-storage warehouses and the like, the partially protected locations under canopies, marquees, roofed open porches, and the like, shall be considered to be damp locations with respect to the above requirement."

There is an additional NEC requirement that I see consistently violated in winery process areas which is as follows:[2]

b) Corrosive locations: "Fixtures installed in corrosive locations shall be of the type suitable for such locations."

Light fixtures in tank rooms, under catwalks, or pipe racks, fixtures in bottling rooms, barrel fermentation rooms and other areas where fermentation takes place and/or clean up is made with caustic cleaners and steam cleaners, should be carefully selected if you want them to have a reasonably useful life.

Ambient temperature

You will find that most fixture manufacturers list the ambient temperature conditions that their fixtures are designed to operate in.

I strongly suggest that, before purchasing a fixture or allowing an electrical contractor to install a lighting fixture for either outdoor or indoor application, you check the manufacturer's information on ambient temperature design limitations. You can be assured that in the summertime in most areas of California, a fixture rated for operation in a 40°C (104°F) ambient will have a short life under a non-insulated canopy over your press area.

We recommend that fixtures for most applications in the wine process areas be rated to operate in a 55°C ambient minimum.

You also need to be aware that besides maximum ambient operating temperature limitations there are also minimum temperature concerns. Again, most manufacturers will publish information on the minimum ambient temperature conditions for their fixtures. You will have difficulty starting all fluorescent and HID fixtures that are in locations where the ambient temperature goes below their design minimum temperature.

Another often overlooked NEC requirement, which governs the installation of a lighting fixture by either an electrical contractor or winery personnel, is the conductor temperature rating in the fixture junction box. Since the fixture releases heat by radiating from its own body, temperatures in the fixture junction box, where the wiring system conductors meet and join the fixture conductors, often exceed the temperature rating of the wiring system conductors.

The NEC requirement is:

"**Insulation**: Fixtures shall be wired with conductors having insulation suitable for the environmental conditions, current, voltage, and temperature to which the conductors will be subjected."[3]

This often requires that the branch circuit conductors bringing power to the fixture meet the temperature ratings specified on the fixture label or in the fixture installation instructions. Often, the normal building wire used in fixture branch circuits will not meet these temperature limitations and a higher temperature rating conductor will have to be spliced to the branch circuit wires prior to entry into the fixture junction box.

Fixture types

There is a sea of fixture types. It is beyond the scope of this report to look at each type, style, and manufacturer, but I would like to give some guidelines for intelligent selections.

First, select the lamp type you want to use. Study the application to understand the environmental conditions and consider other factors, such as the fixture's susceptibility to damage, height restrictions, mounting height, and ease of maintenance after installation. Once you have considered these application conditions, you will be in a better position to recognize the ability of the fixture choice to meet the conditions.

For most winery process applications, I consider the following items to be critical in the selection of your lighting fixtures:

1) **Quality** — You will not be pleased with your choice if this is not your first criteria. I suggest that the fixture housing be made of corrosion resistant material, such as die-cast or extruded anodized aluminum, high-impact plastic, or stainless steel, with zinc-electroplated or stainless steel hardware.

2) **Optical assembly** — I strongly suggest that you choose glass refractors, where available, for HID fixtures and high impact acrylic prismatic lenses for fluorescent fixtures. Plastic refractors will accumulate and hold a static charge which attracts dust (in particular, carton dust), increasing the need for maintenance or reducing the light output. Glass refractors, on the other hand, generally will allow a more precise control of the lamp efficacy and are an inert surface that will not attract dust and dirt as quickly.

The type of optical assembly chosen will also solve many of the lighting problems that are present in a winery process. Some refractors have a long, narrow distribution that make them ideal for lighting catwalks on top of tanks and aisles under pipe racks.

There are refractors that give a square distribution, which helps give even illumination in a bottling room. There are refractors within fixtures that will put the light where you need it and yet prevent it from spilling beyond the work area to annoy co-workers.

3) **Fixture mounting method** — Be sure that you choose the right mounting hardware for the mounting location. Mounting provisions are often an integral part of the fixture. It may be impossible to mount a fixture on the wall if it is designed to be hung from a conduit. It may also change the lamp position and greatly affect the lamp life, as might be the case with position sensitive MH lamps.

4) **General** — Finally, be sure that the fixture chosen and the electrical connection to the fixture are both suitable for the environment the fixture will be in. Be sure the fixture is listed for wet locations, if it will be in a wet location.

Understand that a fixture selected incorrectly can be a hazard to your winery, personnel, and your 'see-ability'. I strongly recommend that you get involved with the fixture selection process and not just let the electrical contractor install the least expensive fixture or the one that happens to be in stock at the local supply house. ■

References

1. NFPA-70 National Electrical Code Article 410-4(a), pages 70-301. National Fire Protection Association, Copyright 1989.
2. NFPA-70 National Electrical Code Article 410-4(b), pages 70-302. National Fire Protection Association, Copyright 1989.
3. NFPA-70 National Electrical Code Article 410-24(a), pages 70-307. National Fire Protection Association, Copyright 1989.

Light Source Comparison Chart

This chart re-caps the distinguishing characteristics of typical light source types discussed above. In addition to the lamp statistics, the right hand column suggests winery situations for particular lamp types.

Light Source Type	Watts	Initial Lumens	Lamp Efficacy LPW	Color Temp. Deg. K	Color Index CR1	Approx. Rate Life-Hrs.	Mean Lumens 40% Rated Life	Winery Application
Incandescent A23	100	1750	17.5	2500	100	750	NA	Visitor Areas Displays - Closets
Flourescent								Office Areas
F40WW/T12/WMP	34	2750	80	3000	52	15,000+	2475	Laboratories
F40SP35/T12/WM	34	2900	85	3500	73	20,000+	2550	Bottling Room
F32TB/SP35	32	2900	90	3500	75	20,000+	2610	Barrel Racks
Metal Halide								
70 M-H	70	5000	71	3000	75	6000	4200	Warehouses
175 M-H Clear	175	16,600	95	3100	65	10,000	13,300	Crush/Press Areas
250 M-H Clear	250	20,500V 19,500H	82	4200	65	10,000	17,000V 14,000H	Barrel Rooms
400 M-H Clear	400	40,000	100	4200	65	20,000	30,000	Tank Areas
High Pressure Sodium								
35HPS Clear	35	2250	65	1900	20	16,000+	2025	Warehouses
50HPS Clear	50	4000	80	1900	20	24,000+	3600	Crush/Press Areas
70HPS Clear	70	5800	83	2200	20	24,000+	5220	Barrel Rooms
100 HPS Clear	100	9500	95	2100	21	24,000+	8550	Tank Areas
150HPS Deluxe	150	10,500	70	2200	65	10,000+	8950	Landscape Lighting
400HPS Clear	400	50,000	125	2100	20	24,000+	45,000	Parking Lots
100HPS White	100	5200	52	2800	70+	10,000+	4680	Truck Staging Areas

Stuck fermentations

By K.C. Fugelsang[1], Vickie L. Wahlstrom[2], Kevin McCarver[2]

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The premature arrest of yeast activity during fermentation, (commonly referred to as 'stuck fermentation') is of continuing interest to the world wine industry because of increasing instances of seemingly unexplained protracted or otherwise abnormal fermentations.

The problem usually manifests itself as sluggish fermentative activity which culminates in a wine that may have perceivably (and often objectionably) high levels of sugar. Further, these wines may be biologically unstable in that there is the potential for renewed microbial activity during the course of post-fermentation processing and after bottling.

The causes of sluggish and stuck fermentations are numerous (Table I). In addition to those listed below, pesticide contamination could be added. However, this topic is beyond the scope of this review.

Temperature related problems

Historically, winemakers tended to think of stuck fermentation problems as arising from excessive and lethal heat buildup during fermentation. Today, winemakers generally do not consider high fermentation temperatures to be a problem. However, there are some large fermentation facilities with limited refrigeration capabilities that often experience problems associated with high temperature fermentations.

Even though actual temperature tolerances of yeast vary with strain as well as growth medium and other environmental factors, viability in the presence of ethanol tends to subside as temperatures approach 95°F.

The lethal effects of high fermentation temperature are usually attributed to the effect of temperature alone. However, recent work has shown that at elevated temperatures of fermentation, intracellular concentrations of ethanol increase to toxic levels.[36] This is due to the fact that ethanol is passively excreted from the cell. As compared with other types of membrane transport systems utilized by yeast, passive diffusion does not involve energy-activated membrane carriers and, hence, is relatively slow.

Table I. Sources of problem fermentations

1) Fermentation at temperature extremes
2) Nutritional deficiencies (nitrogen, vitamins, and trace metals)
3) Ethanol toxicity
4) Osmoregulation (high sugar must/juice)
5) Long-term anaerobiosis and the need for 'survival factors'
6) Natural inhibitors present on fruit resulting from the activity of molds, or produced during the course of fermentation (fatty acids, killer yeast toxins).

The driving force for passive diffusion (of ethanol) relies solely upon the relative intra- and extracellular concentrations of ethanol. Implicit to this mode of transport is the requirement for the compound (in this case, ethanol) to be soluble in the phospholipid component of the cell membrane. Thus, transport by passive diffusion is generally limited to small molecules such as water, carbon dioxide, oxygen, and ethanol. Given the time delay resulting from the transport mode, it can be envisioned that potentially toxic levels of ethanol may well accumulate intracellularly during active fermentation at warm temperatures.

In their research, Navarro and Durand compared rates of fermentation for *Saccharomyces* growing in 12% (w/v) sucrose solutions at three temperatures (10°C, 20°C, and 30°C).[36] From the onset of fermentation, intracellular levels of ethanol exceeded extracellular concentrations (as expected, given the above discussion) and, in the case of lots fermented at the highest temperature, reached 30% prior to interrupted growth.

At the other end of the temperature spectrum is the problem of fermentations

Fig. 1

Lot I. Control. Starter rehydrated per suppliers' recommendations added at 5×10^6 CFU (approx. 1% v/v).

Lot II. Yeast rehydrated as per Lot 1 and diammonium phosphate (DAP) added at 240 mg/L (equivalent to 2-lbs/1,000 gal).

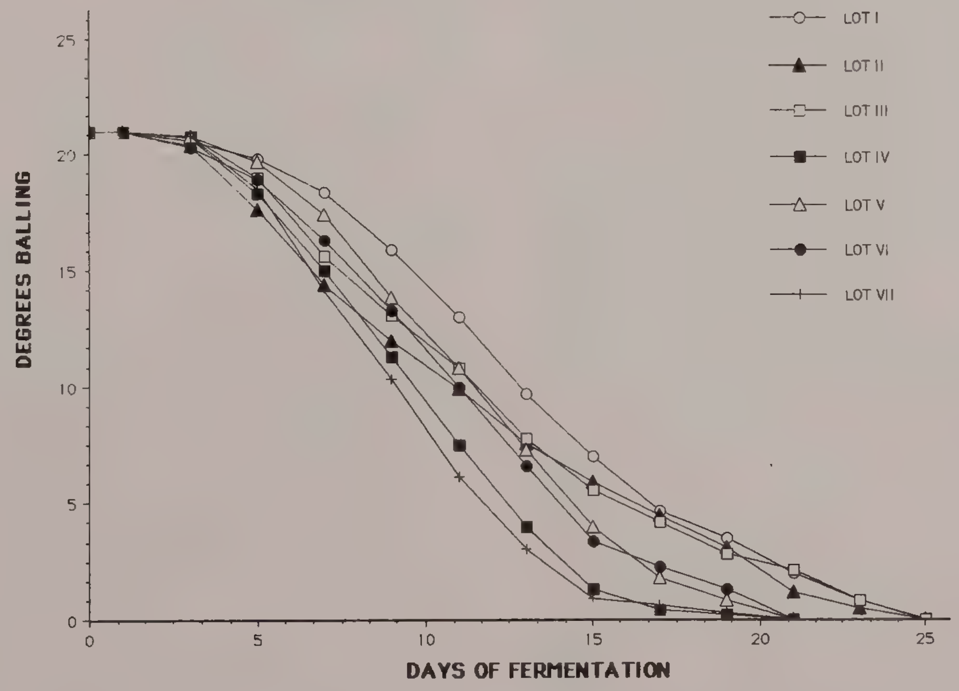
Lot III. Yeast rehydrated as per Lot II and filtered air was bubbled through the starter for 12 hours before adding to juice.

Lot IV. Yeast rehydrated per Lot 1. Yeast hulls added at 0.5 g/L at the start of fermentation. No nitrogen supplement added.

Lot V. Yeast rehydrated per Lot 1. Yeast hulls added at 0.5 g/L during the course of fermentation. No nitrogen supplement added.

Lot VI. Yeast rehydrated per Lot 1. Yeast hulls added at 0.5 g/L at the start of fermentation and 2-lbs/1,000 gal DAP added.

Lot VII. Yeast rehydrated per Lot 1. Yeast hulls added during fermentation. DAP added at 2-lbs/1,000 gal.



at low (<50°F) temperatures. Low temperature fermentations are very popular among winemakers producing certain types of white wines in which the emphasis is on retention of fruit and fermentation volatiles.

However, from the viewpoint of yeast growth, long exposure to low temperatures in combination with potentially low nutrient levels (resulting from highly clarified juice), and near anaerobic conditions may also result in 'problem' fermentations.

For several years, we have examined low temperature fermentations with the focus on utilization of adjuncts (such as different sources of nitrogen and yeast hulls) that may impact the rate and extent of fermentation.

Results of one such study are seen in Fig. 1. Here we compared the effects of variation in starter culture preparation as well as utilization (and time of addition) of above-mentioned supplements on fermentation rate in cold-clarified (suspended solids approximately 1% French Colombard juice fermented at 50°F.

Two significantly different groups of fermentation curves are seen in Fig. 1. Those lots receiving yeast hull supplementation before or during the course of fermentation finished (<0°B) at least 3.5 days earlier than fermentations not receiving supplementation (Lots I, II, and III).

Measurement of final reducing sugar levels also reveals differences between the two groups. In this case, those not receiving hull addition (Lots I, II, and III) stopped fermenting at much higher levels (1.47, 1.29, and 1.44% w/v, respectively) than those with additions (Lots IV at 0.48%, V at 0.28%, VI at 0.36% and VII at 0.56% w/v).

Nitrogen supplementation as DAP at 2-lbs/1,000 gal (then the maximum legal addition level) did not appear to impact fermentation rate or final sugar utilization. Thus it is seen that inclusion of yeast hulls improved utilization of available sugar regardless of whether or not additional nitrogen had been provided.

The importance of high numbers of viable yeast in the timely progress of fermentation has been firmly established. Kirsop concluded, and emphasized, that sluggish fermentations corresponded to low viable yeast cell titer.[26] With this in mind, we also tracked cell numbers during the course of fermentation and found that methodology of starter preparation had a significant impact on cell growth during extended fermentations at low temperatures.

Simple rehydration and addition of yeast at recommended levels (Lot 1) resulted in final cell titer of 9×10^7 CFU over the course of the 3-week fermentation.

By comparison, Lot II included an addition of nutrient in the form of DAP at the start of fermentation. Even though the nitrogen source was added at the maximum approved levels of 240 mg/L (2-lbs/1,000 gal), the resultant fermentation yielded only a slightly higher final cell count (11×10^7 CFU). In this case, stationary phase growth pattern was not seen until the eighth day of fermentation. Thereafter, total cell number did not increase appreciably from the reported level.

On the other hand, oxygenation of starters (Lot III) resulted in higher final cell numbers (15×10^7) than were seen in either Lots I or II.

Lot IV received yeast hull addition (0.5 g/L) at the start of fermentation. Accelerated growth phase cell numbers appeared to be very similar to the oxygenated lot. Total cell numbers in this lot were higher during stationary phase growth than in Lot III.

Lot V received yeast hull addition during the course of fermentation (~15°B). Comparing the fermentation profile with viable cell count reveals that Lot V and the Control (Lot 1) were similar to the point at which the addition was made.

However, with the addition of hulls on Day 8, cell number increases dramatically, reaching a final titer of 19×10^7. Further, growth rate after the addition of hulls was appreciably faster than was seen in either the control or other lots.

Lot VI reached the highest final cell titer seen in the trial (20×10^7). However, as seen from the fermentation curves presented in Fig. 1, fermentation rate was not substantally different from others in the cluster of hull-treated lots.

Nutritional status of juice

Several researchers point to the critical importance of sufficient levels of assimilable nitrogen in successful completion of fermentation.[21,40] The free alpha amino nitrogen (FAN) fraction in juice is the nutritionally important form for yeast growth. Consisting of amino acids and ammonia, this fraction is used to synthesize new yeast cell protein. Expectedly, deficiencies in the form of FAN and ammonium ion have been reported as causative factors behind fermentation problems.

Further, the wine's sensory properties are integrally associated with healthy yeast activity and hence, sufficient levels of assimilable nitrogen during the course of fermentation. Widely recognized examples of nitrogen-related winemaking problems include increased hydrogen sulfide formation resulting from yeast-directed proteolytic activity in FAN-deficient juice as well as formation of higher alcohols (fusel oils) from branched-chain amino acids.[33,54]

Another example of endproduct accumulation, in this case diacetyl (synonym: biacetyl), is seen when brewing yeasts ferment low-versus high FAN worts. In the case of low FAN worts, formation of diacetyl was tied to the levels of the amino acid valine. Specifically, valine synthesis produces intermediates that may themselves be precursors to diacetyl. By comparison, when FAN is not limiting, the amino acid threonine acts to repress the uptake of valine by the yeast and hence, formation of excess of diacetyl is not seen.[18]

Ester formation by yeasts during fermentation is also affected by must nitrogen levels. Ester formation has been correolated with yeast growth under conditions of glucose excess,[33] and when growth is slowed by nitrogen limitation or extended anaerobic conditions.[4]

The Russian literature reports increased formation of sterols during fermentations where there is excess carbohydrate and limiting levels of nitrogen.[37] By comparison, when nitrogen levels are not limiting, minimal amounts of carbon are lost to lipid/sterol formation and fermentation rate increases correspondingly.

Protein biosynthesis utilizes 20 amino acids. These are either synthesized from precursors such as alpha-keto acids, or incorporated directly into the cell. Once inside the cell, amino acids may be degraded to other products (*i.e.*, intermediates of the TCA Cycle, pyruvate, or acetyl-CoA) and NH_3, converted to a related amino acid, or incorporated into protein directly, depending upon the needs of the organism.

Recent research hints that some amino acids may not be directly incorporated into yeast protein. Using radioactively-labelled amino acids, O'Connor-Cox and Ingledew demonstrated random distribution of the label among all yeast amino acids following incorporation.[38] Others such as lysine cannot be degraded and are therefore incorporated directly.

From this, one might conclude that it is total FAN rather than scarcity of specific amino acids that is critical to success. In most cases where specific amino acids are not in extraordinary excess or deficiency, this observation is true.

However, the makeup of specific amino acids comprising the total FAN may have a significant impact upon the rate of fermentation. For example, Ingledew, et. al. report that use of glycine to supplement FAN did not result in improved fermentation rate when compared with unsupplemented controls.[22] Thus, even though the total FAN levels may be acceptable in one lot relative to another, the identity of individual amino acids appears to be important.

With this in mind, there have been reports of positive correlations between deficiencies in the concentration of the aromatic amino acids phenylalanine and tyrosine and the tendency towards problem fermentations. However, supplementation with the former resulted in mixed results.[5]

Yeast requirements for FAN are impacted by initial concentrations of glucose in juice. Jiranek, et. al., found that increasing the concentration of glucose from 20% to 25% resulted in increased demand for amino nitrogen of from 12% to 21% depending upon the yeast strain.[25]

Further, at a fixed concentration of glucose (20% w/v), there were significant differences among yeast strains with regard to amino acid utilization (from 330 to 470 mg/L; average 400 mg/L). These observations point to the potential for selecting yeast strains with nitrogen requirements that are compatible with individual lots of juice.

To this point, we have discussed the results of nitrogen depletion upon yeast activity, from the aspects of fermentation rate and sensory properties of the wine. However, a more fundamental question might be asked: What effect does depletion have upon subcellular organization and resultant biosynthesis?

The yeast's protein biosynthetic machinery (ribosomal RNA and messenger RNA) is tightly regulated by available nitrogen levels and, under conditions of nitrogen stress, is rapidly degraded.[17] The resultant interruption in protein synthesis brings about irreversible inactivation of membrane-associated enzyme systems involved in sugar transport.[9,27]

As the transport of sugar across the cell membrane slows, the cell's energy level is dramatically altered. Specifically, adenosine triphosphate (ATP) produced during glycolysis is not replenished, and this slows (inhibits) the necessary phosphorylation of glucose prior to entering the fermentative pathway.

Thus, the primary sites of inhibition are two: initial cessation of protein synthesis at the level of transcription (m-RNA) and translation (r-RNA), and secondly, an intracellular drainage of ATP resulting from blockage of the membrane-associated phosphorylation step in glycolysis.

It appears as though nitrogen starvation creates for the yeast a physiological dilemma. Initially, it needs available nitrogen for amino acid synthesis so that protein biosynthesis can resume, but it cannot transport the essential components (*i.e.*, ammonium ion and amino acids) across the cell membrane because the cell is energetically drained.

Thus, the practice of attempting to restart stuck fermentations using ammoniacal nitrogen additions (in the absence of fresh yeast inoculum) may well prove to be an ineffective solution.

It is apparent that successful completion of fermentation requires careful attention at the start. Routine analysis of FAN and ammonia in juice is suggested as a tool to assist the winemaker in targeting potentially troublesome lots.

This recommendation is especially appropriate in cases of fruit from locations with a history of nitrogen depletion. Even though the literature provides guidelines based upon research results, each winery would do well to collect data from which individual lots can be compared.

The literature offers a wide range of usable nitrogen levels at which fermentation will proceed without difficulty. In 1977, Agenbach concluded that assimilable nitrogen levels of 140 mg/L were needed for fermentation.[1] Nitrogen supplementation up to 500 mg/L resulted in increased replication (cell mass) and fermentation rate. Beyond 500 mg/L, the fermentation rate increased without the corresponding increase in cell mass.

Based upon the increase in fermentation seen at the upper limits, Vos et. al. considered 878 mg/L as optimal.[54] In California, the average level of FAN in musts is reported to be 449 mg/L while ammonium ion levels are 123 mg/L.[2] Thus, some fermentations may well be at, or below, critical limiting levels with respect to nutrient levels available for yeast growth.

Ammonia (NH_3), present at juice pH as ammonium ion (NH_4^+), and amino acids are the most available forms of nitrogen to yeasts for biosynthesis. However, transport of the ion across the cell membrane requires energy in the form of ATP.

In laboratory fermentations, Salmon reported that ammonia nitrogen supplementation (in the addition range of 23 to 390 mg/L) was totally utilized after 20 to 30 hours of fermentation regardless of its initial concentration.[48]

With regard to amino acid utilization, yeast have a relative priority (preference) of incorporation. Some such as arginine, glutamine, leucine, and isoleucine are normally incorporated early in the course of growth, whereas others such as phenylalanine, are taken up later in fermentation.

The single most important amino acid in terms of relative concentration in juice and preferred status in metabolism is arginine. Jiranek, et. al., reported that this amino acid comprises from 30% to 50% of the total nitrogen used.[25] It is not surprising, then, that analysis of arginine provides the basis of FAN estimates in juice.[58]

Regardless of whether or not a particular amino acid is utilized on a preferred status, it has been reported that addition of ammonia delays (inhibits) uptake and assimilation of amino acids.[43] Recent results highlight the potential importance of this observation in controlling undesirable metabolic byproducts.

Specifically, Jiranek's group suggested that ammonia additions (in the form of DAP) might serve to delay the utilization of arginine and subsequent formation and excretion of urea (a precursor to ethyl carbamate or urethane).

The potential for nutritional problems and depletion of critical nutrients is particularly important in cases where winemakers elect to ferment musts produced from mold-infected grapes or highly clarified musts at low temperatures. To overcome this problem, winemakers were permitted to supplement fermentations with additional nitrogen at levels not exceeding 240 mg/L (approx. equivalent to 2-lbs/1,000-gal). The current use level has been increased to 8-lbs/1,000-gal.

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a difference in the fermentation rate until the available nitrogen is consumed. After that point, curves resemble unsupplemented controls.

At the current maximum BATF-approved addition level of 8-lbs/1,000-gal, some improvement in rate (prior to six days) is again seen, but over the entire course of fermentation there is no significant difference between these lots and a control receiving no supplement. These observations support those of Salomon above.[48]

We have observed that in the case of Botrytis-infected fruit, the mold had reduced the nitrogen available for yeast growth and fermentation. Therefore, nitrogen supplementation at 8-lbs of nitrogen/1,000-gal at the start of fermentation clearly had an impact on the rate of fermentation and the final sugar levels observed. The major difference is seen after day 10 of the fermentation.

Compared to ammonia salts, yeast extract is a more complete (albeit rather undefined) source of available nitrogen. Produced by dehydration of yeast autolysate, yeast extract serves as the basis for commercial nitrogen supplement formulations. As a supplement, it stimulates more rapid and complete fermentation in the case of both conventional white table wine fermentation as well as fermentation of mold-infected fruit.

Trace elements and vitamins

Microorganisms have varying requirements for vitamin supplementation reflecting their relative ability to synthesize these compounds. Those that the microbe can not synthesize must be supplied in the growth medium. Hence, absence or deficiency in one or more vitamins in the growth medium coupled with the inability to synthesize the compound(s) from precursor pools, expectedly may lead to metabolic stress.

Common examples of vitamin requirements include niacin, which is the precursor to the metabolically active form, the coenzyme nicotinamide adenine dinucleotide (NAD). Nicotinamide nucleotides are coenzymes for dehydrogenases. The latter catalyze redox reactions between alcohols and aldehydes. An example of one such important reaction to a winemaker is the reversible reduction of acetaldehyde to ethanol during fermentation.

Yeasts not only vary in their vitamin requirements but also in the degree to which they may be dependent upon that vitamin. Biotin is generally required, whereas folic acid and riboflavin are synthesized by most yeasts and thus are seldom required.[31]

Other examples include pyridoxine which is involved in transamination reactions such as those leading to fusel oil production. Thiamine, present as thiamine pyrophosphate is required for, among other crucial reactions, the decarboxylation of pyruvate during fermentation.

While certain wild yeast such as *Hansenula anomala* can satisfy virtually all their vitamin requirements by direct synthesis, other spoilage species such as the apiculate yeasts *Kloeckera* (and its perfect counterpart *Hanseniaspora*) have absolute requirements for certain ones (i.e., inositol and pantothenic acid). Most *Saccharomyces* require exogenous sources of one or more vitamins.

It should be noted that some vitamins are heat labile and thus, transitory exposure of must or juice to high temperatures (*e.g.*, thermal processing) might reduce their active concentration.

Twelve elements are required by microbes in concentrations of $>10^{-4}$M. These macroelements include carbon, hydrogen, oxygen, nitrogen, phosphorus, and sulfur. Other essential elements are required in lower concentrations. These trace elements include zinc (Zn), manganese (Mn), and several others.

One of the metabolically important metal cations (present in the cell at trace levels) is magnesium (Mg). Magnesium and others (K^+, Mn^{2+}, Zn^{2+}) are important as cofactors in catalytic activity of many enzymes.

Most enzymes that catalyze reactions involving phosphate groups (the majority of those of the glycolytic pathway) require Mg^{2+} or Mn^{2+} as a cofactor.[12] Despite the fact that this has been known for over 30 years, the importance of the magnesium ion (Mg^{2+}) in fermentation has only recently received attention in the literature.[14]

By adding single components of yeast extract, D'Amore's group found that the generally observed stimulatory effect associated with yeast extract could be largely attributed to the magnesium-salt component.[14]

Although less widely recognized, zinc levels are also important in metabolism. Like magnesium, zinc is important as a cofactor in a number of enzyme systems such as DNA- and RNA-polymerases (replicative function) and alcohol dehydrogenase.[29] Further research in this area may well provide an explanation for some of the problems associated with fermentation.

Ethanol toxicity

Maintenance of cell integrity and organization is essential to the continued activity of healthy cells. The cell membrane serves as a semi-permeable barrier that plays a vital role in the yeast's ability to maintain osmotic balance and regulate transport of essential nutrients into and metabolites out of the cell.

Ethanol formation during fermentation eventually reduces membrane function (in the latter stages) and impedes diffusion of alcohol out of the cell. The resultant stress arising from increases in intracellular alcohol is detected as decreased fermentation rate.

Discussions of 'ethanol toxicity' are initially complicated by terminology (*e.g.*, ethanol **toxicity** vs. **tolerance**) and by the fact that there is no single standard laboratory method for demonstrating either. Upper limits for toxicity vary with yeast strain, temperature, and the composition of the medium in which the test is run.

The biochemistry and genetics of ethanol tolerance are subjects of debate. However, considering that ethanol tolerance in yeast is not under control of any single gene,[23] this is not suprising. Further, ethanol-tolerant mutants are not easily isolated by conventional screening and selection techniques and, unfortunately, without these tools, fundamental elucidation of the problem is hindered.

There are several ideas on the mechanism(s) by which ethanol inhibits *Saccharomyces*. Among the proponents of each, there is general agreement that the alcohol acts upon growth and fermentation in a noncompetitive manner. Thus, its presence in the cell membrane alters the normal bidirectional movement of carrier protein and substrate complexes across the membrane but not the binding affinity of carrier and substrate. Furthermore, ethanol appears to interfere with maximum velocity of transport.

Undefined interactive factors affect ethanol inhibition. For example, it is recognized that the concentrations at which ethanol becomes inhibitory are lower when produced by yeast compared with addition of equivalent amounts of ethanol to already growing cultures. These observations, in part, can be explained in light of the earlier discussion of fermentation temperature and accumulations of potentially lethal intracellular levels of ethanol.

Since ethanol is an effective denaturant at physiologically produced levels, speculation as to site(s) of inhibition initially centers on one or more enzymes of the glycolytic pathway. The likely candidates include hexokinases and alcohol dehydrogenase.

At lower temperatures of fermentation, ethanol formation is expectedly slower and hence more closely coincides with subsequent diffusion out of the cell. This can be compared with studies reporting intracellular accumulations of ethanol approaching 30% when fermentations are carried out at 30°C.[36] In this regard, at least one study questions the importance of ethanol (at levels of less than 10%) in enzyme inhibition.[32]

If ethanol is not directly toxic to enzyme activity, what other site(s) might be vulnerable to its effects? Since ethanol is soluble in both aqueous and lipid phase, it may well act to interfer with the structure and function of the cell membrane. Particularly important in this regard would be involvement with cell membrane-associated transport enzymes such as those responsible for uptake of glucose and critical amino acids.

Evidence points to the importance of membrane unsaturated fatty acids in ethanol tolerance. Comparing relative ethanol sensitivity of a range of fermentative yeasts from the very tolerant (such as *S. sake*) to relatively sensitive strains (such as Brewer's yeast) clearly shows that increased ethanol tolerance coincides with a greater percentage of **unsaturated** fatty acids relative to the **saturated** fatty acid component.

Using the index of saturated fatty acid (stearic C16:0) to unsaturated (oleic C18:1), the ratio was always less than 1 for ethanol tolerant strains and greater than one for ethanol-sensitive yeasts.[11]

This observation is not unique to fermentative yeasts. Increased levels in membrane unsaturated fatty acids are also seen among ethanol tolerant bacteria (*Zymomonas mobilis*) grown in the presence of ethanol. Thus, fatty acid unsaturation may be an evolutionary adaptation to life in the presence of ethanol.

In addition to the trend towards formation of unsaturated fatty acids, ethanol also stimulates formation of longer chained fatty acids. In the case of spoilage lactic acid bacteria (*L. homohiochii* and *L. heterohiochii*) capable of growth at over 18% ethanol, unusually long-chained, monounsaturated fatty acids are found (C20-24).

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In the case of *L. heterohiochii*, over 30% of the fatty acids are over 20 carbons in length.[50]

In summary, separation of inhibition due to ethanol toxicity from that due to nitrogen depletion is difficult. The two appear to act in concert, with ethanol disrupting the normal activities of membrane-associated transport enzymes.

Further, some components of yeast autolysis, including cell wall and membrane debris (collectively referred to as 'yeast ghosts' or 'hulls'), are known to enhance yeast's resistance to ethanol toxicity and thus may play a 'protective' role in mitigating ethanol sensitivity among the remaining metabolically active members of the yeast population.[47] Identified examples include amino acids, nucleotides, vitamins and metal ions.[10,30,35]

Osmotic pressure

The inhibitory activity of high sugar concentrations towards fermentative yeasts is believed to result from interactive effects of osmotic pressure and subsequent increases in the concentration of intracellular ethanol.

In one study, the osmotic pressure of the fermentation medium was artificially raised with addition of the unfermentable sugar-alcohol, sorbitol.[39] In this case, the yeast could take up the compound but not metabolize it.

The inhibition centered on the accumulation of intracellular ethanol. That is, the osmotic pressure of the growth medium slowed and eventually prevented passive diffusion of ethanol out of the cell. Results clearly showed that with increased osmotic pressure (more sorbitol) yeast viability and rate of fermentation decreased.

'Survival factors' and importance of oxygen

Ergosterol and oleic acid play important roles in membrane pliability and permeability and, thus, in the function of enzyme transport systems such as those involved in sugar and nitrogen uptake. Since they are synthesized only under aerobic conditions, the yeast is confronted with a finite concentration that decreases during the near anaerobic period of fermentation.

During fermentation, each budding cycle of the yeast reduces the sterol content of the membrane by approximately ½. When the sterol content reaches a critical point, replication stops and the resulting yeast population must carry on and finish the fermentation. Thus, depletion due to repeated budding may play a critical role in membrane integrity and thus the success or failure of long-term anaerobic growth.

In laboratory trials, inclusion of ergosterol and oleic acid in the fermentation medium has a dramatic impact on the rate of fermentation. While it has been shown that exogenous supplementation of ergosterol and oleic acid obviates the need for oxidative synthesis,[21] addition of either compound is neither a presently recognized or approved winemaking procedure.

Despite this, winemakers may influence levels of these critical membrane components at the time that yeast starters are prepared. During the final stages in the commercial production of Wine Active Dry Yeast (WADY), producers generally manipulate growth conditions such that upon rehydration, the yeast will have sufficient steroid and lipid content for four to five budding cycles. This corresponds to 5-7 days of fermentation. Beyond this, repeated budding under anaerobic conditions results in depletion in levels of essential membrane components.

While prefermentation aeration of yeast starters has been common practice in brewing, the technique has only recently been suggested as a tool in winemaking. This can easily be accomplished by 'rolling' or sparging yeast starter tanks with filtered compressed air. As a corollary to this, the practice of purging tanks with nitrogen or CO_2 prior to juice transfer may serve to delay the onset and rate of fermentation.

The grape itself can supply at least a portion of the lipids needed by yeast during anaerobic growth. Thus, incorporation of a period of skin contact, in addition to being a valuable stylistic tool in the production of certain wine types, can play a definite and positive role in long-term yeast growth.

In cases of extended pomace contact, either before or during fermentation, essential components are extracted from the cuticle and carried into the juice fractions where they are available to the yeast. Oleanolic acid composed up to ⅔ of the cuticular waxes present in varieties studied. This fatty acid has been found to replace the yeast's requirement for ergosterol supplementation under anaerobic conditions.[6]

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Thus, fermentations of highly-clarified musts receiving minimal or no skin contact have a greater potential of experiencing fermentation abnormalities than corresponding lots in which there was skin contact.

Other naturally occurring inhibitory metabolites

Other sources for reduced yeast activity may include fermentation of mold-infected (i.e., *Botrytis cinerea*) high sugar musts. Mold growth, in general, depletes available nitrogen needed for subsequent yeast growth.[58]

In addition, fermentations utilizing late harvest fruit traditionally are carried out at low temperature and may continue slowly for months before they eventually subside. A byproduct of the growth of this mold includes the biological toxin botryticin which is thought to impinge negatively upon yeast activity.

However, the toxin may be of secondary importance as the source of sluggish fermentations. The synergistic effects of unusually high initial sugar levels in combination with alcohol formation and reduced nutrient availability are credited as the more likely candidates for inhibition. [21]

Membrane fatty acid inhibition

A bewildering situation occurs when sluggish yeast activity is noted in fermentations where initial nitrogen and carbohydrate analyses would not suggest problems. It has been known for some time that during fermentation, yeasts synthesize medium chain length fatty acids (6 to 12 carbons) which accumulate and eventually become toxic. The most commonly reported fatty acids are hexanoic, octanoic, and decanoic acids and their ethyl esters.[46,51,52]

These medium-chain fatty acids are produced and excreted during fermentation as intermediates in the biosynthesis of long-chain fatty acids and lipids rather than as the result of hydrolysis of the longer-chained fatty acids.[51] Regardless of their origin, it is believed that they operate in concert with ethanol to disrupt normal membrane operations of nutrient uptake and end-product excretion.

The levels of fatty acid inhibition appear to vary with the acid in question as well as yeast strain and the conditions of growth. When octanoic and decanoic acids were added to growth media (at levels of 16 mg/L and 8 mg/L — normal in wine) with a sublethal concentration of ethanol, the growth rate of *Saccharomyces* was decreased.[46]

On a molar basis, the order of toxicity was found to be decanoic acid > octanoic > ethanol. This decreasing order parallels the decreasing solubilities of each compound in the lipid component of the cell membrane.[46]

Since the undissociated molecules of octanoic and decanoic acids are readily soluble in the phospholipid component of the yeast cell membrane, it is believed that they enter the cell by passive diffusion.[52] Once lodged within the cell membrane, they interact with functioning components to bring about decreases in hydrophobic interactions, such as those that occur between lipid and protein as well as between various lipids. As a result, the spatial organization of membrane components is altered, bringing about interruption in critical transport systems and membrane permeability.

Viegas et. al., also speculated that the

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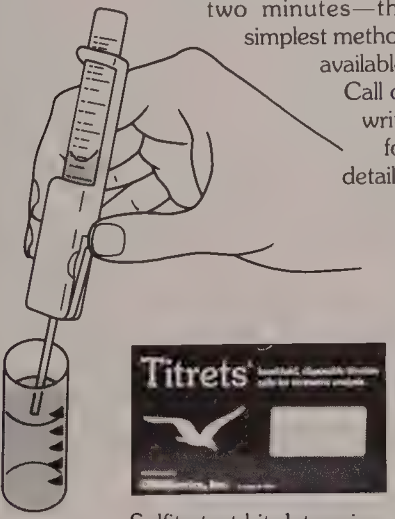

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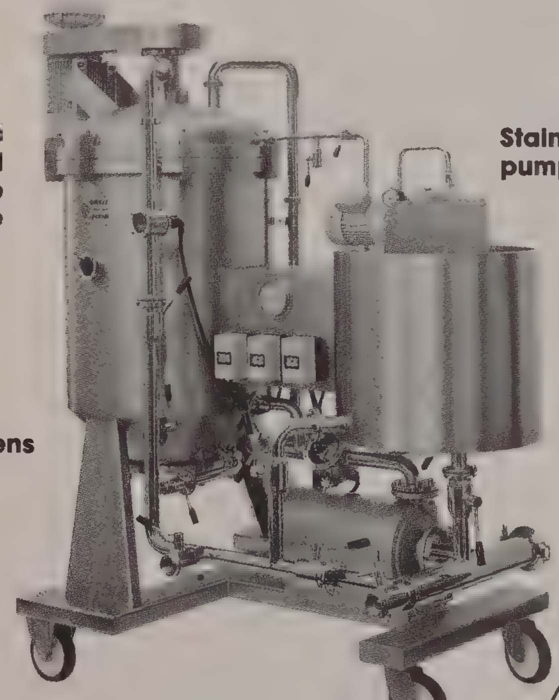
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mechanism of inhibition (in the case of octa- and decanoic acids) is similar to that seen with benzoic acid.[52] That is, at low extracellular pH, the undissociated acid enters the cell (owing to solubility in the lipid component of the cell membrane) and once in the cytoplasm undergoes dissociation to yield a proton (H^+) and the respective anion.

While it is possible that intracellular accumulation of protons may eventually inhibit glycolytic pathway enzymes (*i.e.* phosphofructokinase), it is also likely that there is a significant and potentially lethal drain of energy (ATP) associated with transport of these accumulating intracellular protons out of the cell. This energetically expensive expulsion is necessary to maintain physiologically acceptable pH levels within the cell.

Killer Yeasts

It has been known for almost three decades that certain strains of *Sacc. cerevisiae* harbor foreign pieces of nucleic acid (the 'killer factor') that, when expressed, code for a toxin that inhibits and kills other sensitive strains of yeast.

Yeasts are categorized into three groups with respect to production and/or sensitivity to killer toxins. Aside from killer and sensitive strains, some neutral strains that neither produce toxin nor are sensitive to it have been identified.[56]

Based upon the properties of the toxin, killer strains of *Saccharomyces* yeasts have been classified into three groups (K-1 through K-3). Early work centered on characterization of the K-1 toxin.[7] Production and biological activity of K-1 is optimal at pH 4.6 to 4.8.

Since K-1 is probably not of importance in grape fermentation, it was thought that killer yeasts did not play a significant role in winemaking. This was the belief until rather recently when K-2 toxin was described.[49,57]

By comparison to K-1, the K-2 toxin is stable over a wider pH range (2.8 to 4.8) and, thus, may be of significance in wine fermentation. To date, the nature, distribution, and importance of K-3 is not reported although van Vuuren and Wingfield state that K-3 producing yeast potentially may play a role in winemaking.[55]

Sensitivity to a specific killer toxin is generally limited to species (and their strains) within a genus. However, killing between species of separate genera has been noted.[34,42,45]

The evidence suggests that the killer toxin disrupts electrochemical gradients of the cell membranes of sensitive cells, making them more permeable to hydrogen ions (protons) and resulting in an uptake and accumulation of protons from the surrounding medium. It does this by forming channels across the cell membrane.[8] The additional 'load' placed on the yeast to eject accumulating protons (at the expense of ATP) effectively drains or de-energizes the cell.

While the inclusion of 'killer factor' in commercial active dry yeast strains is becoming commonplace,[20] the potential for problems arises when killers interact with sensitive strains.

In this regard, van Vuuren and Wingfield reported isolation of K-2 killers from five stuck fermentations in South Africa.[55] In one case, followup laboratory fermentations using the respective isolated killers and sensitive strain revealed that the mortality rate of the sensitive strain after

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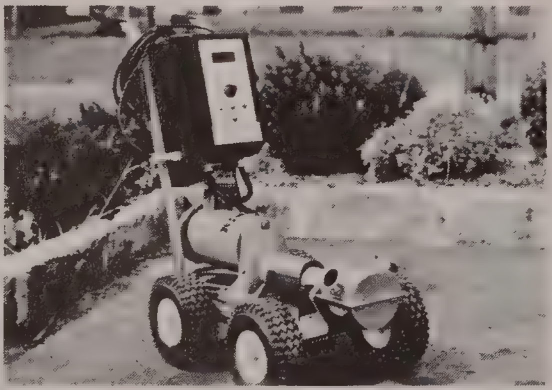

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three days of fermentation at 20°C (with the killer strain) was 70%. By comparison, corresponding fermentations utilizing single-culture inocula of the sensitive strain exhibited less than a 3% mortality.

Since marketing of killer strains for use in fermentation is likely to continue, utilization of sensitive strains may well be limited to facilities that are able to exclude killers. The research of Van Vuuren and Wingfield recommended that neutral yeast strains be used as inocula in commercial fermentations or as reinoculum in the event of sluggish/stuck fermentations resulting from the presence of killers.

Conclusion

The physiological status ('wellness') of yeast at any point during fermentation is the result of immediate and cumulative imbalances of environmental and physiological origins. The manifestation of these imbalances (*i.e.*, sluggish and stuck fermentations) very likely arises as the result of more than one factor.

The concept of interactive forces is crucial to understanding why fermentation problems arise. As a case in point, recall the earlier discussion of nitrogen deficiency's role in bringing about irreversible disruption in sugar transport systems and, subsequently, how failure to transport sugar into the cell blocked uptake of further nitrogen.

Thus, to attempt identification of a single cause for what is, in fact, a complex interaction of environmental and physiological factors leading to fermentation anomalies would seem naive.

Someday research will, no doubt, provide the winemaker with all the critical parameters needed to ensure that problems will not arise during fermentation. Meanwhile, however, we must draw upon and utilize available information as it relates to fermentation in the relatively hostile environments of high sugar and acid media.

In this regard, properly prepared vigorous starters represent an important first step in successful fermentations. As has been emphasized in other reviews on this subject, many (if not the majority) of documented fermentation problems could likely have been prevented by careful attention to this critical step.[19]

In this review, an effort has been made to approach the subject from a comprehensive point of view: The interactive impact of individual environmental pressures upon the major player in the game — the yeast. ■

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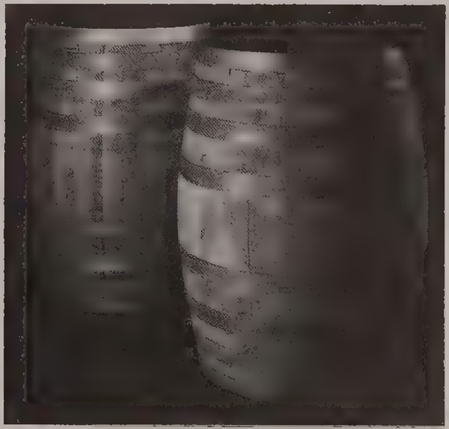

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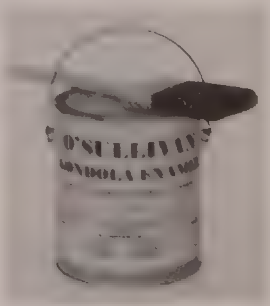

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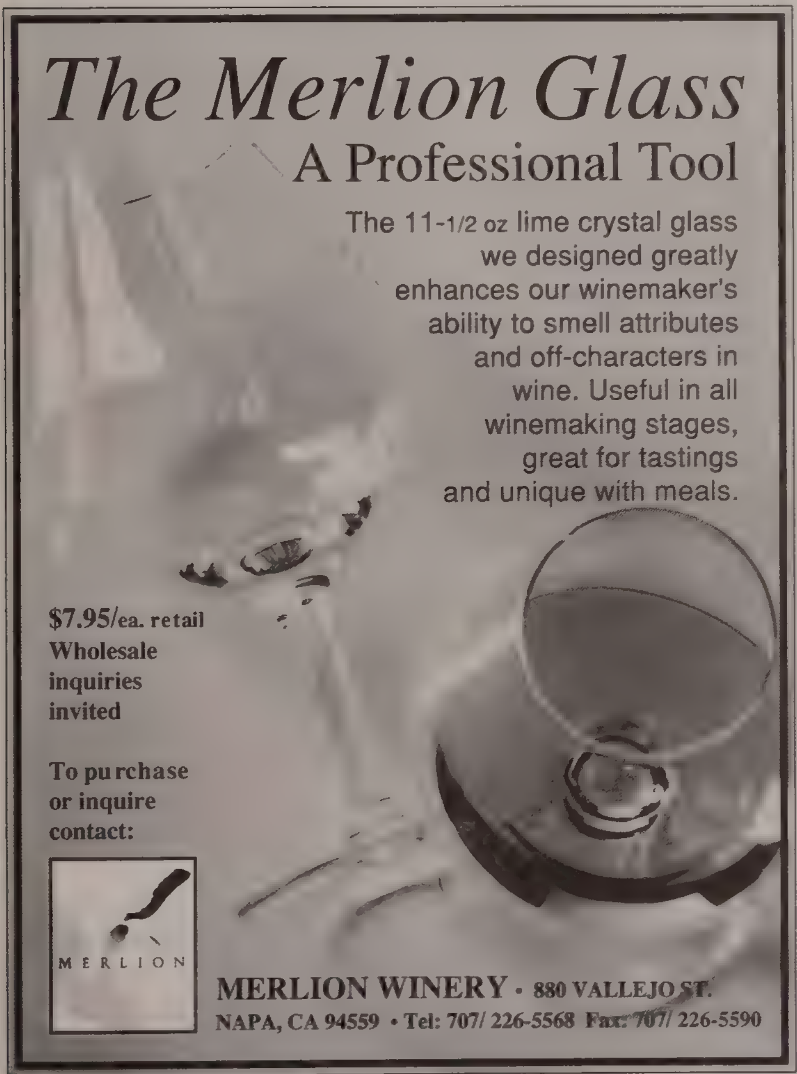

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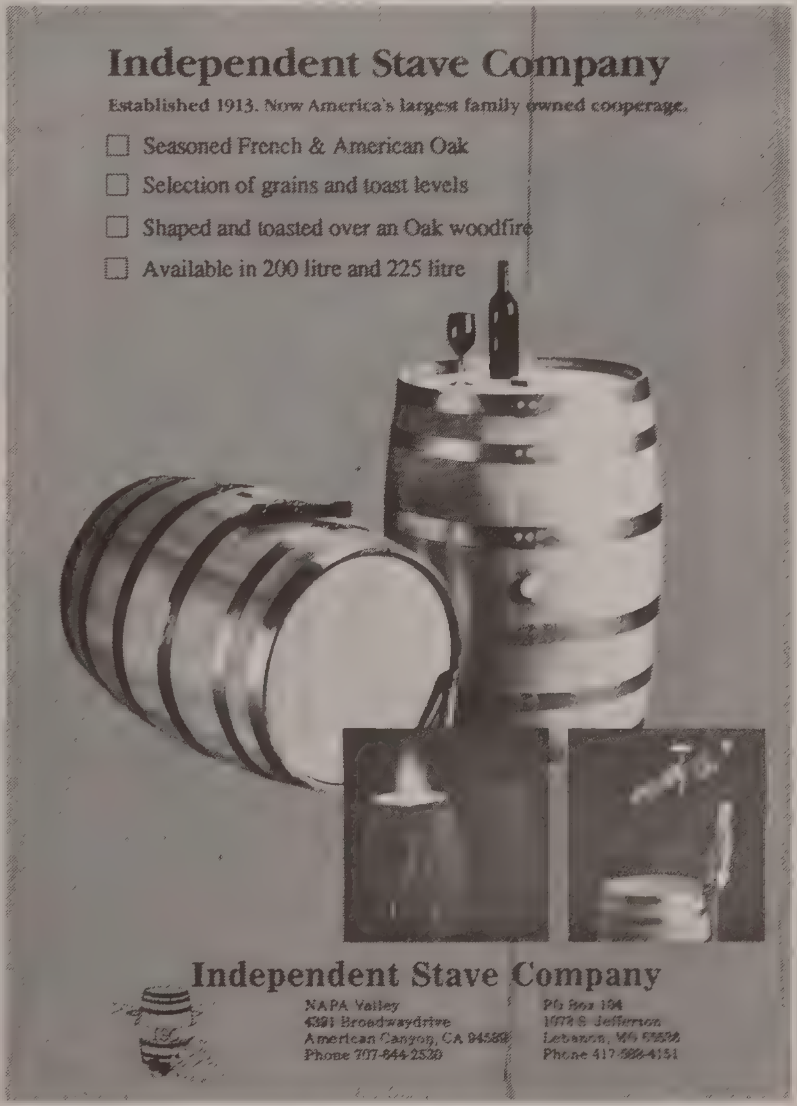

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PART III

Méthode champenoise survey

By Bruce Zoecklein
Dept. of Horticulture, Virginia Polytechnic Institute/State University
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The flavor profiles of méthode champenoise (MC) differ considerably. There are three principal stimulations: 1) the tactile base influenced by the extract and astringent elements; 2) the perception of acidity, which depends upon the cations present, buffering capacity, alcohol, and sugar levels; and 3) the sugar taste produced mainly by the interaction of acid, alcohol, and sugar.

Initial processing decisions can influence the flavor profile. This is Part III of the results of a **PWV** survey on méthode champenoise production.

The majority of MC producers (7 of 13 outside of California, 16 of 17 in California) do whole cluster pressing. This allows separation of the three juice zones within the grape: juice from pulp between the seeds and skins, from the pulp near the skin, and from the pulp surrounding the seeds.

Each juice zone differs in titratable acidity, tartrate/malate ratio, pH, phenols, sugar content, flavor constituents, yeast titer, and color.

The area halfway between the skins and the seeds yields the initial juice extracted which is rich in both acid and sugar and low in phenols and varietal flavor constituents.

Press fractions

Most MC producers seek a delicate aroma in their cuvees which is associated with the initial juice — the *vin de cuvee*. The prestige cuvee or *tete de cuvee* is usually made from the finest cuvees, generally from the juice of the first and most gentle pressing.

Nine California producers separate two press fractions for Chardonnay, seven reported three fractions. Four wineries noted that they may separate as many as four fractions. The average first cut for both Chardonnay and Pinot Noir was reported at 115 gal/ton with the range from 100 to 130 gal/ton.

Later press fractions, *vin de taille*, often possess the characteristics of high pH, low titratable acidity, excessive color, high phenol content, and a high level of non-soluble solids. *Vin de taille* can make perfectly agreeable sparkling wine; however, it is fruitier, less fresh, and less elegant than the *vin de cuvee*. The elevated pH, reduced acidity, and higher phenol content may limit its ageing potential.

Most report that the *vin de taille* is used in extra dry, sec, demi sec, or table wine rather than brut. Juice of the final pressing or *vin de rebeche* is often lacking in acid, is somewhat bitter, and may have considerable color.

Table 1.
California Pinot Noire press fractions*

Press Fractions	**1**	**2**	**3**
Yield gal/ton	110	20	7
Total Phenols mg/l GAE	200	250	320
AB 520 NM	.25	.62	1.10
T.A. g/100 ml	1.3	1.1	.95
pH	2.8-3.1	3.1-3.25	3.3-3.45

* *Data averaged from several sources.*

Separation of several juice fractions during pressing is often determined by taste, although one California respondent reported separation entirely by press pressure (0.4 to 2.0 Bar). There is a drop in the titratable acidity following the extraction of 110 to 120 gal/ton, depending upon the grape cultivar, maturity, and growing conditions (see Table I). Chardonnay always give a greater juice yield than Pinot Noir, due to the fact that this cultivar contains more pulp.

Grape handling and pressing

To avoid extraction of excessive aroma and phenols from the skins, care is employed in grape handling. Most producers carefully hand-harvest into containers to minimize berry breakage.

Of 30 sparkling wine producers surveyed, all but three reported hand-picking. Two of the three reported a combination of hand and mechanical, and one producer harvests entirely by machine. Either lug boxes or ½-ton bins are used for harvested grapes by 80% of the California respondents. Others report using 1- to 3-ton gondolas.

Although mechanical harvesting increases the potential for juicing, it allows a large crop to be harvested quickly at the optimum level of maturity. The goal is to deliver cool grapes and load the press as quickly as possible with minimal juicing.

The **PWV** survey reported a trend in the sparkling wine industry to employ tank presses, membrane presses, or champagne ram presses. This is an important consideration affecting production efficiency and components extracted from the juice.

The level of total phenols and types of phenols present is a function of the press design and press pressures, among other factors. For example, Chardonnay from the first cut with a total phenol content of 200 mg/L G.A.E. can be expected to have approximately the following constituents: 100 mg/L nonflavonoids caffeoyl tartrate and related cinnamates, 30 mg/L nonflavonoids tyrosol and small derivatives, and 50 mg/L flavonoids — especially catechins and flavon polymers (tannins).

The nonflavonoid fraction is relatively constant in the initial pressing of white and red grapes because these compounds are present mainly in the easily extracted juice. The nonflavonoid fraction of cuvees not exposed to wood cooperage totals about the same as from the juice. There is, however, considerable modification and some may be lost or gained with ageing.

Most nonflavonoid phenols are individually present below their sensory threshold. The additive effects are believed to contribute to bitterness and spiciness.

Flavonoids such as catechins are extracted from the skins with increased press pressure and may vary with the type of press employed. Catechins account for most of the flavor in cuvees. The *vin de cuvee* (first press cut) produced by low press pressures and thin layer pressing is low in total phenols, particularly in flavonoid phenols, often resulting in low extracts.

Unlike traditional basket presses and ram type presses, membrane and tank presses provide more complete control over the pressing operation, high yields, produce less non-soluble solids, and require low press pressures. Low press pressures aid in minimizing color extraction and the chance of macerating the stems, which would release bitter phenols into the juice. A membrane press can press to dryness at two atmospheres while many ram-type presses require 10 atmospheres pressure to achieve a dry cake.

Seven MC producers (two California, five non-California) do not press whole clusters but simply crush and drain. Crushing, rather than pressing whole clusters, mixes the three fractions shown in Table 1 and can result in increased extraction of 100 mg/L phenols G.A.E. or more depending upon the cultivar, degree of maceration, and fruit temperature. The sensory threshold for phenols in white wine is about 100 mg/L (Singleton and Noble 1976).

Juice clarification

The juice is settled or centrifuged prior to fermentation at 25 of 30 wineries. Ten producers gave specific levels of non-soluble solids — ranging from 0.3% to 3% — that they aim for.

Eight wineries (three in California, five non-California) fine prior to primary fermentation. The Californians used casein with bentonite to reduce color. Wineries outside of California that crush, rather than press whole clusters generally do pre-fermentation fining to reduce bitterness, astringency, and color. The fining agents included PVPP, gelatin, and bentonite.

Primary fermentation

Barrel fermentation can impact the phenol (principally non-flavonoid) components of some sparkling wines. Eight of 16 California MC producers report some barrel fermentation of their cuvee (average 20%, range 1% to 75%). The toasting level of the French oak barrels varied. Average age of the barrels was 2.8 years but ranged from new to six years old.

Fermentation in wood allows for the extraction of phenols (mainly non-flavonoids) from the barrel. Many of the larger, more harsh phenols bind with proteins of the cuvee and precipitate. The resultant goal of barrel fermentation is added structure and complexity without significant harshness or astringency. Often the additional phenols extracted are balanced with a certain residual sugar added in the dosage (see Table 2). ■

Table 2. Analysis of Several Stylistic Parameters of Five California Méthode Champenoise

Product	Alcohol %	TA g/L	pH	Malic mg/L	Sugar g/L	Lactic g/L	Total Phenols mg/L	Non-flavenoid Phenols mg/L
Blanc de Blancs	11.9	8.25	2.94	2148	6.1	0.35	200	190
Brut	12.3	7.50	3.22	472	8.9	2.75	310	300
Brut	12.4	8.40	2.98	3229	11.3	0.02	260	255
Blanc de Blancs	11.4	8.70	3.01	1988	4.9	0.50	215	205
Blanc de Noirs	11.7	8.70	3.03	2046	0.55	0.55	205	200

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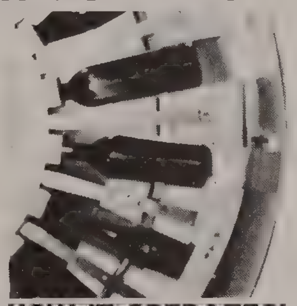

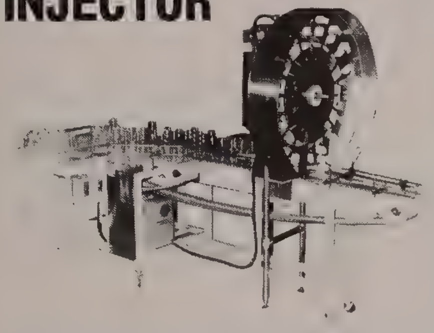

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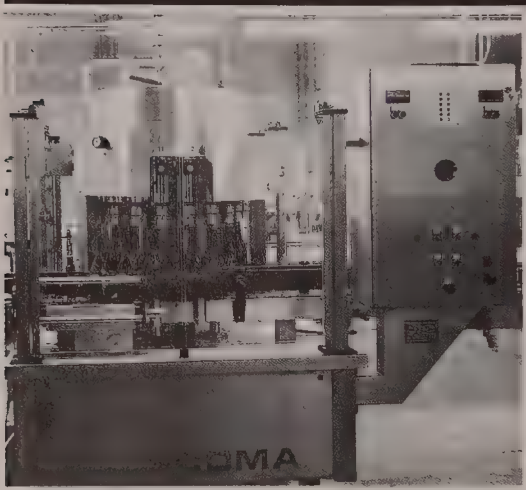

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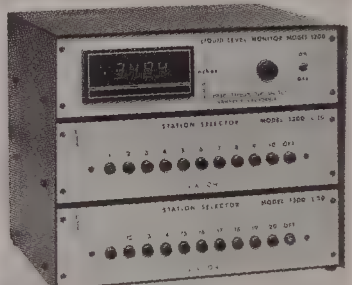

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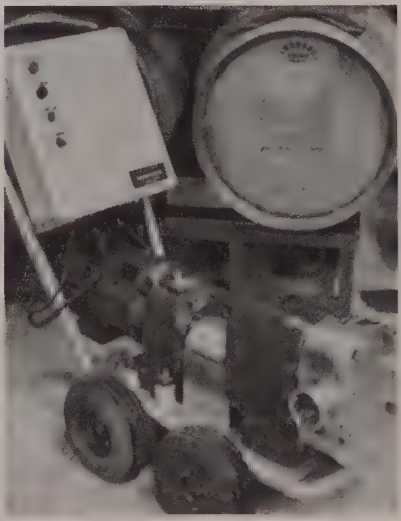

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5425 Napa-Vallejo Hwy, Vallejo, CA 94589, tel: 707/255-6481, fax: 707/257-8028

Cork Associates 815-816
'SPARK' high-end champagne corks by Amorim & Irmaos, S.A. and wine corks with different bleaching options: traditional, chlorine-free, and natural.
902-M Enterprise Way, Napa, CA 94558, tel: 707/224-6000, fax: 707/224-7616

Cork Supply International 612

Custom Cooperage /Innerstave 914
American oak barrels, oak Innerstaves, shaving and repair.
24200 Arnold Dr. Sonoma, CA 95476, tel: 707/996-8781

Danstar Ferment 805
Supplier of a selected range of active dried yeast with specific winemaking properties. Distributed in North America by Vinquiry.
44 Montgomery St.#500, San Francisco, CA 94104, tel: 415/955-0555

Demptos Glass Co. 325-326

Demptos Napa Cooperage 820
Premium, hand-split, air-dried, French oak barrels (28-L, 56-L, 112-L, 225-L, and 500-L sizes). Choice of forest origin from Allier, Limousin, Nevers, Troncais, or Vosges. A facility in Napa, CA allows firings for special toastings or experimental activities.
849 Jackson St., Napa, CA 94559, tel: 707/257-2628, fax: 707/257-1622.

Duarte Nursery Inc. 109
Grafted grapevines. Potted green vines are a new option for your vineyards. Many certified rootstock varieties are available.
1555 Baldwin Rd., Hughson, CA 95326, tel: 1-800/GRAFTED, fax: 209/531-0352

Eagle-Pitcher Minerals, Inc. 608

Enerfab 515

Estate Bottling 604
Portable wine bottling at your winery, two-label capacity—1,500 cases/day.
PO Box 338, Rutherford, CA 94573, tel: 707/963-5705

Euro-Machines, Inc. 916
Winery equipment includes Europress (1,800-L to 25,000-L capacity), destemmer/crushers, MOHNO must pumps. Vineyard equipment features Braud 2720, a self-propelled harvester and multipurpose machine with a new harvesting system, and the Braud 524, a tractor-pulled grape harvester.
PO Box 843, Culpeper, VA 22701, tel: 703/825-5700, fax: 703/825-5789

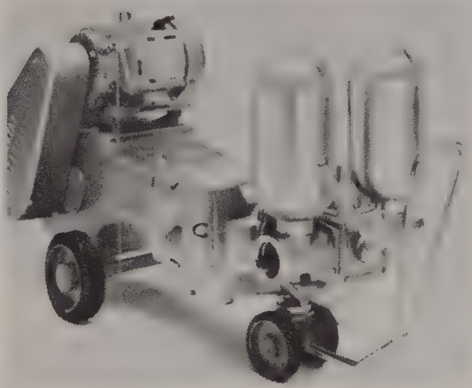
Expo Instruments 814
Time-proven liquid level and temperature monitors and controls, now geared for smaller wineries with new, less expensive systems.
1026 W.Maude Ave.#301, Sunnyvale, CA 94086, tel: 408/245-8822

fp Packaging & Portocork 828-829+900-901
Diemme tank presses; DeSilla destemmer/crushers; filtration equipment: plate + frame, lees, horizontal screen D.E., rotary vacuum; bottling and packaging equipment; still wine and champagne corks.
PO Box 881, S.San Francisco, CA 94083, tel: 415/742-5400; Portocork: 93 Park Ln., Brisbane, CA 94005, tel: 415/742-5442

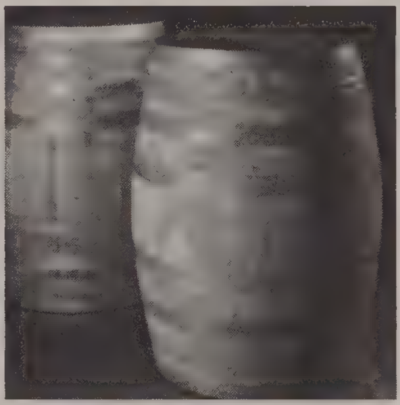
Fine Arts Graphics 913
Specialty label division offers in-house foil stamping, blind embossing, die cutting, engraving thermography and lithography of wine labels.
10955 SW Avery St., Tualatin, OR 97062, tel: 503/692-3550 (OR); 415/788-6066 (CA)

Fisher Scientific Co.	507
G & D Chillers	200-201
GAF Chemicals Corp.	615
Georgia-Pacific Corp.	706-708
Gist Brocades Food Ingrd.	1026
Glass Tech	825

Gordon Graphics 807-808
Wine labels, posters, table tents, back cards, printing, embossing, foil-stamping, U.V. and aqueous coating in house.
15 Digital Dr., Ignacio, CA 94949, tel: 415/883-0455


Compleat Winemaker

Cork Associates


Blue Grass Cooperage

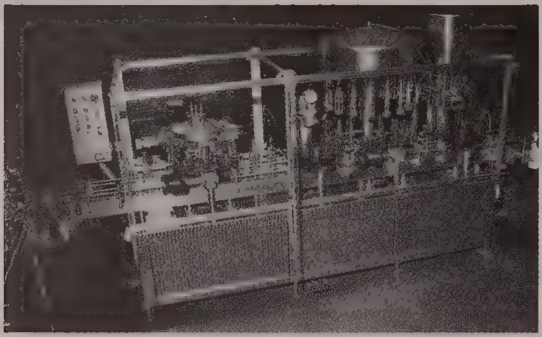
Euro-Machines

Fine Arts Graphics

INNERSTAVE

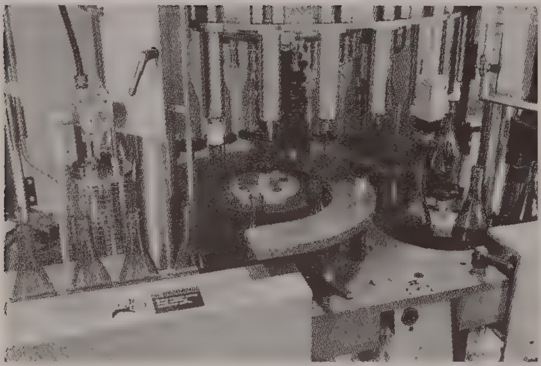
Custom Cooperage/
Innerstave

Demptos Napa Cooperage

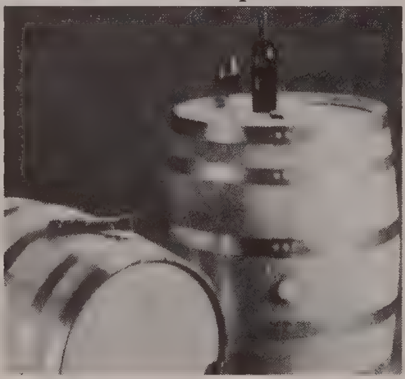


PEC/AWS

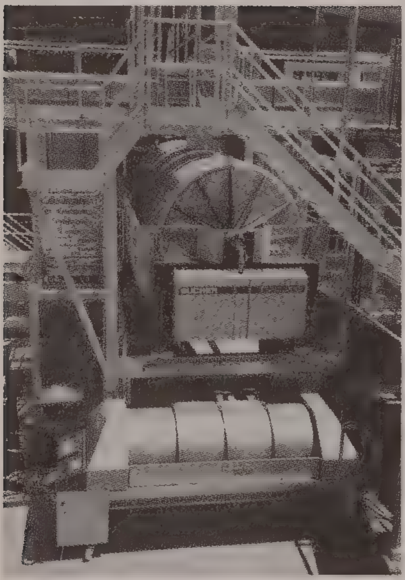
Krones



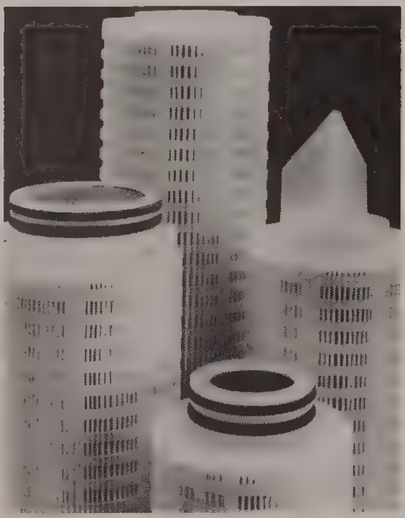
Independent Stave



KLR Machines

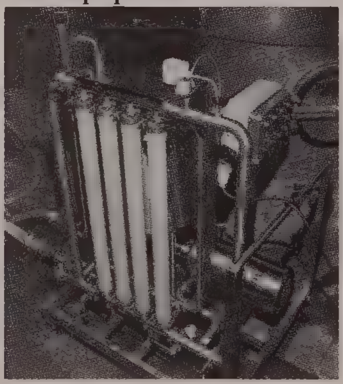


Millipore



Hall & Bartley

RLS Equipment



Great Western Chemical Co. 621
Bentonite, chemicals, cleaning supplies, Genencor enzymes, filter media, fining agents, yeast.
3595 E. Wawona, Fresno, CA 93725, tel: 209/485-4150, OR Richmond, CA, tel: 415/235-4810

Groskopf Warehouse	524
Gulson & Associates	803
Hach Company	419

Hall & Bartley 523
Architecture and planning of winery facilities.
4701 Old Redwood Hwy, Santa Rosa, CA 95401, tel: 707/544-1642

Hewlett Packard	704
Hi Seas Industries Inc.	826
Holchem, Inc.	705

Independent Stave Co. 1000
Air-dried, fire-bent French oak or American oak barrels with choice of toast and grain.
PO Box 104, Lebanon, MO 65536, tel: 417/588-4151; OR 4391 Broadway Dr., American Canyon, CA, tel: 707/644-2530

K. Tamura & Co.	624
Keystone Valve USA	925

KLR Machines 714-716+809-811
SANOPLAST PVC capsules; VASLIN destemmer/crushers, presses and pumps; BECO filter media and SIHA fining agents; BUCHER membrane and tank presses; ROMICON microporous crossflow Winefilter; and UNIPEKTIN evaporators, desulphurizers, dealcoholizers.
350 Morris St.#E, Sebastopol, CA 95472, tel: 707/823-2883, fax: 707/823-6954 OR 47 W.Steuben St., Bath, NY 14810, tel: 607/776-4193, fax: 607/776-9044

Krones, Inc. 225
A systems approach to processing and packaging is available. An AcuVac vacuum filler with lowerable, non-drip valves that eliminate a lift piston and also has dynamic fill height correction and adjustment, bowl nitrogen sparging, and laminar flow of product into the bottle, will be exhibited. Krones offers U.S.-manufactured counter-pressure and vacuum fillers, corkers, labelers, conveyors and inspection equipment from 40 bpm to 1,000 bpm.
9600 S. 58th St., Franklin, WI 53132-0100, tel: 414/421-5650, fax: 414/421-2222

Lafitte Cork & Capsule 402
Wine corks, wine capsules made of tin/lead, or tin, or aluminum, or PVC, or polylaminate.
908 Enterprise Way, Napa, CA 94558, tel: 707/258-CORK

Latchford Package Co.	628-629
Lawson Mardon Label	318
Liquid Air Corp.	607

McBrady Engineering 234
Four sizes of ORBIT bottle cleaner and sparger from 60 bpm to 250 bpm.
PO Box 204, E.Hazel Crest, IL 60429, tel: 708/798-6565, fax: 708/798-6596

Millipore Corp. 528-529
Durapore-TP 0.45 and 0.65μ cartridge filters for aseptic filling; Milligard and Polysep pre-filters; sanitary cartridge housings; crossflow microfiltration, ultrafiltration, and reverse osmosis systems; microanalytic lab supplies.
80 Ashby Rd., Bedford, MA 01730, tel: 800/632-2708

Milton Roy Co.	614
Paul Mueller Co.	717-719
New Jersey Machine Inc.	821

PEC/AWS, Inc. 609-610+620
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Prospero Equipment Corp., 134 Marble Ave., Pleasantville, NY 10570, tel: 800/332-2219, fax: 914/769-6786 OR Associated Winery Systems, Inc., 7714 Bell Rd., Windsor, CA 95492, tel: 800/228-0664, 707/838-2812, fax: 707/838-3164

Pacific American Warehousing/Trucking	1001
Pall Ultra Filtration	909-910
Pasco Poly Tank	209-210
Permea Inc.	720
Perten Instruments	904

Pickering Winery Supply 415-416
Winery production and accounting software; O'Sullivan coatings; chorine-free Sabate corks; polylaminated and PVC capsules; chemicals; tank washers; yeast, and malolactic bacteria.
1300-22nd St., San Francisco, CA 94107, tel: 415/821-2400

Plastics Internacionals SA	713
Polymer Technologies Inc.	516
Precision Stainless	404

Pro Sales Inc.	802
Process Engineers	915
Quiedan Co.	505-506
Rain Bird Sales Inc.	721

Ramondin USA Inc. **520**
All-tin capsules, tin/lead and polylaminated capsules.
PO Box 2266, Napa, CA 94558, tel: 707/944-2277

Red Star Products	905
Red Star Yeast	908

RLS Equipment Co. **625-626**
Bottling equipment, Amos destemmer/crushers, pumps, presses, filter equipment, mixers, S/S ball and butterfly valves, hose, corks and capsules.
PO Box 282, Egg Harbor City, NJ 08215, tel:609/965-0074; RLS West (Calif.) tel: 800/527-0197

Robbins & Myers Inc.	412
Santa Rosa Hydraulics	405

Santa Rosa Stainless Steel **926**
Stainless steel storage and fermenting tanks. Dejuicing tanks and systems, aluminum catwalks, portable storage tanks, stock fermenting tanks.
PO Box 518, Santa Rosa, CA 95402, tel: 707/544-7777, fax: 707/544-6316.

Scholle Corp.	1005
Schott-Great Lakes Instrmnt.	806
J. Scott Co.	521

Scott Laboratories, Inc. **700-701+722-725**
Bottling equipment, capsules, corks, Rohm Tech enzymes, Velo filtration equipment and media, fining agents, malolactic bacteria, pumps, Rauch destemmer/crushers, Willmes presses, Velo roto-tanks, and Lallemand yeast.
2220 Pine View Way, Petaluma, CA 94975, tel: 707/765-6666

Seguin Moreau **315-317+408-410**
French oak barrels, Bordeaux export, Chateau, Burgundy in export or traditional styles. Choice of wood and toast.
2180 Jefferson St., Napa, CA 94559, tel: 707/252-3408

Shae Industries	413
SITEVI French Trade Show	822
Snowden Enterprises	509

SEN Machines Inc. **420**
Bottling equipment, filtration equipment, labelers, destemmer/crushers, mash pumps, and nitrogen generator equipment.
1350 Industrial #G, Petaluma, CA 94952, tel:707/763-4844; Fax:707/763-6997

Sonoma Grapevines Inc. **105**
Sixteen grafted certified rootstocks are available in 1991 and we will have 20 for 1992 suited to many different soils from serpentine to wet conditions.
1919 Dennis Ln., Santa Rosa, CA 95403, tel: 707/542-5510

Source Scientific	711
Spokane Metal Products	619

Stefanich **712**
West Coast agent for Tonnellerie Mercier, exhibiting French oak cooperage; Bordeaux export, Bordeaux chateau, Chateau Ferre, Burgundy export, and Burgundy traditional barrels. Also exhibiting Stefanich tapered wood tank fittings.
PO Box 77021, San Francisco, CA 94107, tel:415/771-1958; Fax: 415/771-1959.

Summit Engineering **605-606**
Consulting civil engineering, feasibility studies, permit assistance, site development, drainage hydrology/hydraulics, water supply systems, wastewater management, structural design.
1400 N.Dutton Ave.#22, Santa Rosa, CA 95401, tel: 707/527-0775, fax: 707/527-0212

Tec-Era Engineering	922-924

Tonnellerie Francaise **525**
Importing French-coopered barrels, tanks, and bottles. Cooperage of French and American oak in Chateau, Ferre, Bordeaux, and Burgundy styles — traditional and transport.
1401 Tubbs Ln., Calistoga, CA 94515, tel: 707/942-9301, fax: 707/942-5037

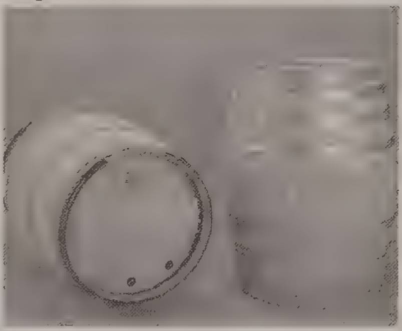
Tonnellerie Radoux **903**
Specified French oak origin barrels, tanks, and ovals from a family-owned cooperage selecting all stave wood at the actual forests.
Agent: Boswell Co., 1000 Fourth St.,#540, San Rafael, CA 94901, tel: 415/457-3955, fax: 415/457-0304

Turrentine Wine Brokerage **827**
Helping winemakers to know and control their options, increase profits, control risks and take advantage of opportunities in supply and demand trends. Bill Turrentine and staff will be on hand to answer questions.
122 Tunstead Ave., San Anselmo, CA 94960, tel: 415/454-4546

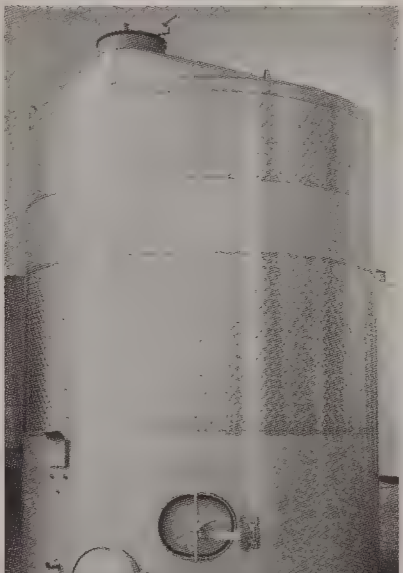
Tonnellerie Francaise

Tonnellerie Radoux

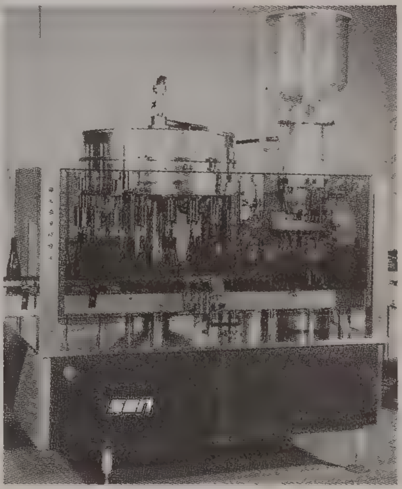
Seguin Moreau



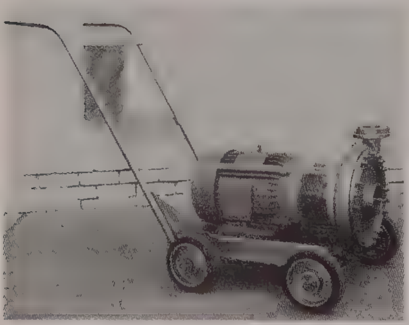
Santa Rosa Stainless Steel



SEN Machines

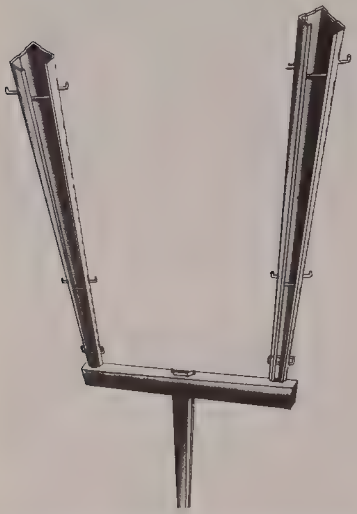


Scott Laboratories

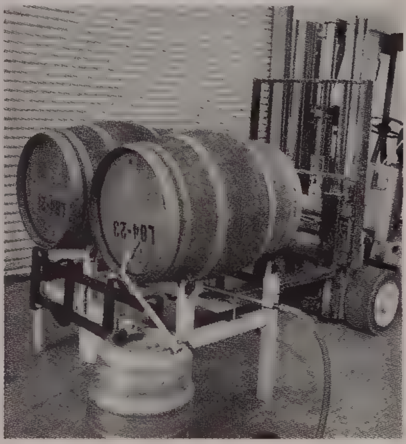


Valley Pipe & Supply

Viticultural Services



Western Square Industries



Wemco/LMH Pump

Valley Pipe & Supply Inc. **522**
Winery and industrial supplier of wine pumps, crushers, sample crushers, PCT stainless and bronze hose fittings, wine hose, stainless tubing, valves, and instrumentation.
1801 Santa Clara, Fresno, CA 93709, tel: 209/233-0321, fax: 209/233-1713

Van Waters & Rogers 500
Vin Table 710

Vintners Supply Co. **526-527**
Crosible filter cloths, Depa diaphragm pumps, Shriver filter presses, and Millipore filtration equipment.
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2180 Jefferson St., Napa, CA 94559, tel: 707/255-1294, fax: 707/226-9026

VWR Scientific 800

WEMCO Pump **920**
Manufacturer of the hidrostal screw-centrifugal pump mounted on portable or stationary base for delicate grape handling or general use.
PO Box 15619, Sacramento, CA 95852, Tel: 916/444-7160 OR Calif. Distributor: LMH Inc. 936 Detroit Ave. #N, Concord, CA 94518, tel: 415/686-6400, fax: 415/686-3836

Western Square Industries, Inc. **702-703**
Fork-liftable steel barrel racks, puncheon racks and (as pictured) a barrel-roller system. Also offering barrel rack refurbishing and custom powder coating.
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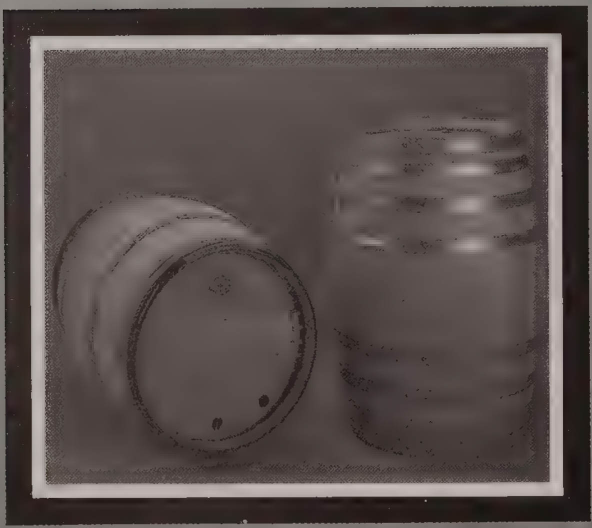
Wilden Pump & Engineering 424-425
Willamette Industries 417-418

Wine Appreciation Guild **423**
Tasting room supplies, wine glasses, books, poster, gift items.
155 Connecticut, San Francisco, CA 94107, tel: 415/864-1202

YSI Inc. 622-623

SEGUIN MOREAU
Tonnellerie



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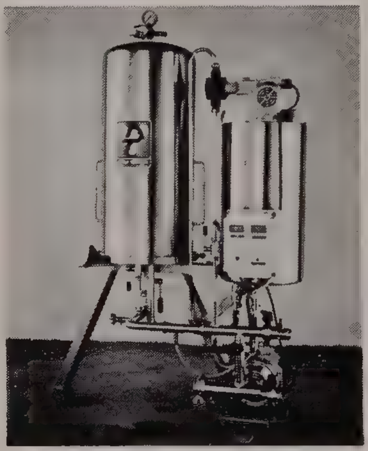
pec / AWS, Inc.

Della Toffola EC.AUTO



"Reduce filtration costs"
Della Toffola's advanced design horizontal pressure leaf filters can greatly reduce your filtration costs by replacing costly pads with D.E. Call and ask about a demonstration in your winery and see it increase your profits.

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(West Coast Sales)
7714 Bell Road,
Windsor, CA 95492
800/228-0664 ● 707/838-2812

SEE US AT ASEV IN BOOTHS 609-610+620

Continued from page 5

fermenting of wine) the Federal and state of California organic food laws define as 'processed.' And 'produced' according to these laws means grown, *i.e.*, up from the soil. That's a start.

'Fermenting' is a term that falls under the definition of a 'processed food' in both Federal and California state organic food laws. Therefore 'wine' is a processed food. I don't understand why as an industry, we expect a special law defining 'wines' separately from other food products especially when we want wine to be viewed as a food by the public and our lawmakers.

To continue, "Organically grown in accordance with the California Organic Foods Act of 1990", can only be applied to raw agricultural commodities.

This statement would not only be misleading but unlawful to put on any 'processed food' such as wine. The sole statement, under the current definition of the law, that may be applied to wine and all other processed foods bottled or packaged after Jan. 1, 1991 must refer to California Health and Safety code Section 26569.11. There is no provision in either the past or present State or Federal laws that allows a product to be labeled or represented as being 'organic' if the product was not 'processed' in accordance with these laws; even if the materials that went into the product were organically grown.

Wines that are made from organically grown grapes but not organically processed, (using prohibited materials such as sulfites) fall into the above example. This point is unfortunate because we as an industry use sulfites to help preserve the quality of traditionally processed wines.

Wineries and vineyards who are using sustainable agriculture in grape growing should have the ability to market their positive influence on the environment to their consumers.

Currently, several 'organic/organically grown' wine products are under investigation because some producers and importers have misunderstood or ignored the State of California's definition of organic. Unlike the Bureau of Alcohol, Tobacco & Firearms (BATF) allowing a 'use up' if a product isn't within product compliance; the U.S. Dept. of Agriculture and California Dept. of Health & Safety will pull product from the market and implement severe fines and penalties.

We at Hallcrest Vineyards are currently trying to work with Assemblyman Farr's office who authored the State Bill and the California Certified Organic Farmers (CCOF) to have Assembly Bill #2012 amended so that wines using organically grown grapes but not organically processed will be able to identify the grapes as being organically grown on the label.

The two hurdles to having this done are: Sulfites are earmarked to be put on the Bill's 'prohibited materials' list, and that unlike other foods, wines are not required to have ingredient labeling, making it difficult for consumers and the State of California to determine what other ingredients that may have been used in the winemaking process, were or were not organic.

The Organic Grapes into Wine Alliance (OGWA) winemaking standards are sound, and should be considered by winemakers who appreciate less synthetic additives in the production process. But these standards do not comply with the current California organic law and should not be used for that type of reference. I recommend consulting with CCOF based in Santa Cruz, CA, the California Dept. of Health Services, PO Box 942730, Sacramento, CA 94234, or your friendly attorney.

I support OGWA's promotion of sustainable agriculture, although I am concerned about their 'all or nothing' approach to lobbying for sulfites, (a synthetic preservative when added) as an ingredient in organically processed foods.

I know that it is difficult for winemakers to think of sulfites as an 'unnatural' added ingredient in the winemaking process. We have been using it to create high quality wines for over 500 years. But lawmakers and consumers simply do not equate synthetic preservatives, such as sulfites, and other food type of ingredients, like spices.

We should concern ourselves more with a provision in the U.S. Organic Food Production Act of 1990, that allows the Food and Drug Administration and the Environmental Protection Agency to establish a national list of prohibited substances that may 'harm human health.' If ethanol is established on this list, the concept of organic wines and wines produced from organically grown grapes may be mute.

Sincerely,
John C. Schumacher,
President, Winemaker
Hallcrest Vineyards
The Organic Wine Works

Dear Editor:

Thank you for the opportunity to contribute to "Elements of In-line and Rotary Labeling Machines", which appeared in the March/April'91 **PWV**.

We discovered a misprint pertaining to rotary labeler speeds of 1,000 bph. This is incorrect. Rotary labelers operate at speeds in excess of 1,000 bpm.

Please help us to clarify this point for **PWV** readers.

Sincerely,
Konie Breneman, Marketing Manager
KRONES, Inc.

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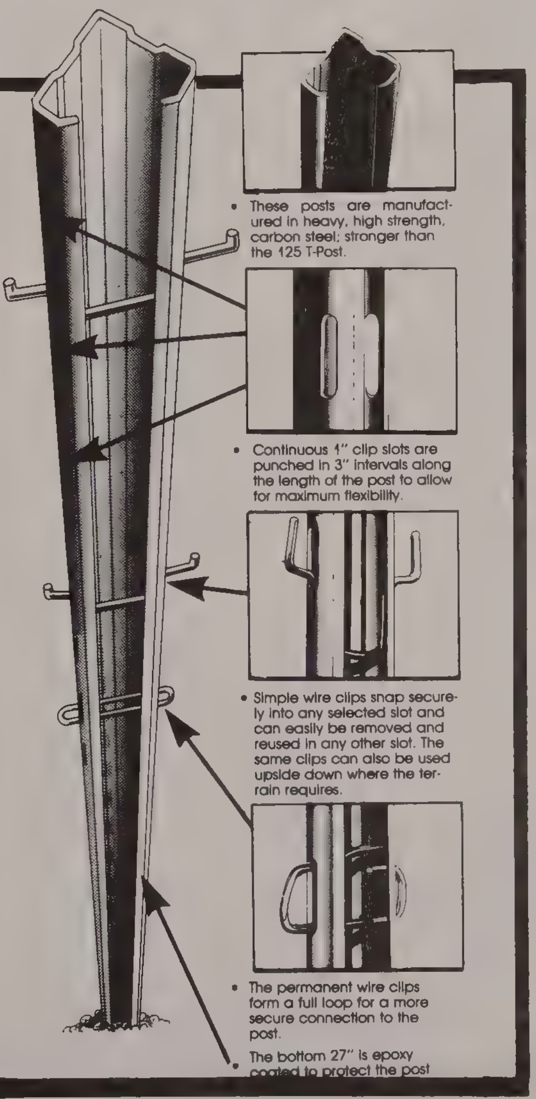
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Michael Garner, Paul Merritt
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Robert M. Parker, Jr.
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Richard P. Vine
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June 18-19, Tuesday-Wednesday
International Symposium on Nitrogen in Grapes and Wine. Location: Seattle Convention Center, Seattle, WA. **For more information, call:** ASEV, 916/753-3142.

June 20-22, Thursday-Saturday
1991 Annual Meeting of American Society for Enology & Viticulture. Location: Seattle Convention Center, Seattle, WA. **For more information, call:** ASEV, 916/753-3142.

July 10-14, Wednesday-Sunday
1991 Annual Meeting of American Society for Enology & Viticulture/ Eastern Section. Location: Erie Plaza Hotel. **For more information, contact:** Dr. Tony Wolf, Virginia Polytechnic Institute, 2500 Valley Ave., Winchester, VA 22601, tel: 703/667-8330, fax: 703/667-5692.

July 11-13, Thursday-Saturday
World Vinifera Conference on Cabernet Sauvignon & Merlot — Location: Sheraton Hotel and Towers, Seattle, WA. **For more information, contact:** Washington Wine Commission, PO Box 61217, Seattle, WA 98121; tel: 206/728-2252, fax: 206/441-3140.

Grapegrowing/Winemaking Courses University Extension, UC Davis, CA

July 15-18, Monday-Thursday — Wine Processing Workshop at UC Davis. **Instructor:** Roger Boulton, PhD, Dept. of Viticulture/Enology. **Time:** 9am - 4:30pm. **Fee:** $650.

July 19, Friday — Vineyard Canopy Assessment Workshop at UC Davis. **Instructor:** Mark Kliewer, PhD, Dept. of Viticulture/Enology, UC Davis. **Time:** 9am - 4:30pm. **Fee:** $100 (includes bag lunch).

July 20, Saturday — Managing the Home Vineyard at UC Davis. **Instructors:** Nancy Rosner and Eddy Szyjewicz, DeVine Consultants, Los Gatos, CA. **Time:** 9am - 4pm. **Fee:** $95.

July 26, Friday — Crush'91: Pre-crush Training at Glen Ellen Winery, 1883 London Ranch Rd., Glen Ellen, CA. **Time: 9am - 4pm. Fee:** $70.

August 3, Saturday — Successful Home Winemaking at UC Davis. **Instructor:** Jim Lapsley, winemaker, Orleans Hill Winery, Woodland, CA. **Time:** 9am - 3pm. **Fee:** $60.

For further details and to enroll by phone, call 800/752-0881. Davis and Dixon residents or outside California call 916/757-8777. ■

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Refractometers — $170; pH pens — $99; lab chemicals, glassware, apparatus. **Custom Lab Supply**, 2127 Research Dr., Livermore, CA 94550, phone: 415/449-4371.

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Colloidal silica, or kieselsol, is a colloidal dispersion of nanometer-sized silicon dioxide particles with a tremendously large reactive surface area. These particles are very heavy for their size and at the pH of wine have a net negative charge which reacts with gelatin or other fining agents with a net positive charge.

When used in conjunction with a gelatin, colloidal silica is one of the most powerful clarifiers in white wines or juice. It is used to compact bentonite lees, improve clarity, settling, and filtration cycles.

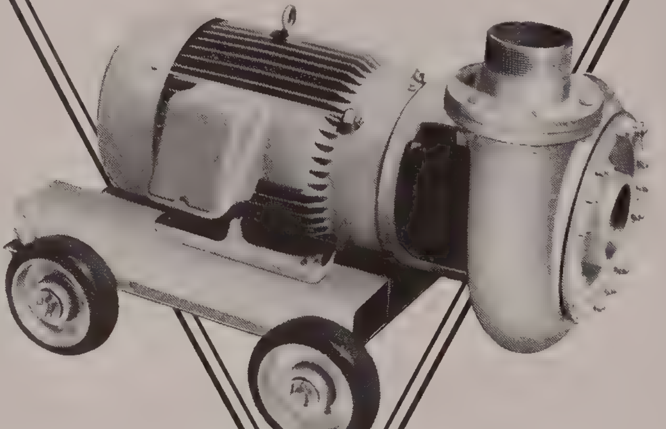
For more information, contact: **Cellulo Company**, 2949 E.Townsend Ave., Fresno, CA 93721, tel: 209/485-2692, fax: 209/485-4254; OR 27 North Ave. 'E', Cranford, NJ 07016, tel: 201/272-9400, fax: 201/272-8735.

PLEASE SEE OUR AD ON PAGE 5

Criveller Company

Criveller carries a complete line of chemical products for the wine industry. All of the products manufactured by AEB from Brescia, Italy, are available.

The most used clarifying agent for white wines is MICRON-96. This is a pure micronized casein which is used to clarify must, new wines, and old wines. The product is very easy to dissolve in water and its dosage varies from 1-gram/gal. to



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4-gram/gal., depending upon the product to be treated. MICRON-96 is excellent for curing oxidized wines and to correct color in old wines.

Oenocyanine (grape skin extract) from vinifera grapes is also carried in stock. This product is used to adjust color in red wines.

For a complete list of Criveller chemical products, please contact: **Criveller Co.**, 6935 Oakwood Dr., Niagara Falls, ONT. Canada, L2E 6S5, tel: 416/357-2930, fax: 416/374-2930; OR Box 162, Lewiston, NY, 14902; OR 591 Cement Hill Rd., Fairfield, CA 94533, tel: 707/425-9264.

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Great Western Chemical Co.

Enzymes manufactured by Genencor International, Inc., PVPP produced by GAF Corporation, bentonite, and other wine treating materials are available from Great Western Chemical Co.

Genencor International offers Pectinol® RS pectolytic enzyme and Pectionol HS pectolytic enzyme for fruit and wine processing. Both preparations are derived from a selected strain of *Aspergillus niger* and contain pectinases, pectin lyase, and polygalacturonase which function to depolymerize pectin. Advantages of use include increased free run juice, improved pressability, improved settling rate, improved lees compaction, and increased filtration rates.

Pectinol RS and Pectinol HS are both packaged in 44-lb. polyethylene pails. Packaging in 200-L drums is available upon request. Pectionol products are warehoused near wine processing regions.

For more information, contact: **Great Western Chemical Co.**, 3595 E.Wawona Ave., Fresno, CA 93725, tel: 209/485-4150, fax: 209/485-0605; OR call: Richmond, CA 415/235-4810; Santa Rosa, CA 707/526-2324; Stockton, CA 209/982-5781; Bakersfield, CA 805/392-1101; Coronoa, CA 714/272-1480.

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KLR Machines, Inc.

The specialized fining agent, isinglass, produced by SIHA in Germany, is available from KLR Machines. Isinglass, a natural fining agent from fish bladders is sold in the form of dried sheets. The active compound of this fining agent is collagen, a proteinaceous material with high molecular weight and excellent precipitation characteristics. Collagen in wine has a very strong positive charge, and therefore leads to the flocculation of relatively large particles.

The dried SIHA isinglass has a long shelf-life if kept in cool, dry, odor-free storage. Preparation for use involves swelling the dried SIHA isinglass in water, draining the water and transferring the SIHA isinglass to a small amount of high acid, sulfited wine. When the sheets become clear and gelatinous, this wine solution is vigorously mixed to uniformly dissolve the SIHA isinglass. This solution can be used immediately or stored 6 to 10 weeks if it has 100 ppm free SO_2 at 50°F or cooler.

For more information, contact: **KLR Machines, Inc.**, 350 Morris St.#E, Sebastopol, CA 95472; tel: 707/823-2883, fax: 707/823-6954 OR 47 W.Steuben St., Bath, NY 14810; tel: 607/776-4193, fax: 607/776-9044.

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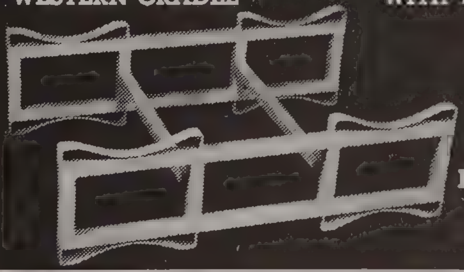

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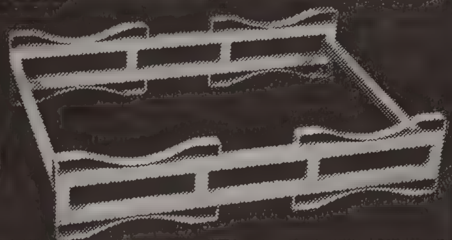

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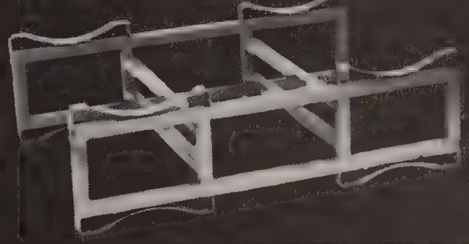

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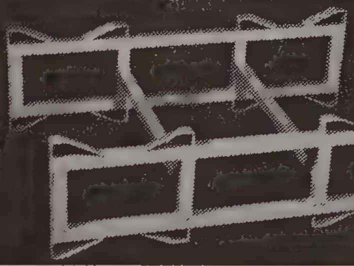

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Scott produces two proprietary wine fining agents — Sparkolloid and Cold Mix Sparkolloid. Sparkolloid is specifically designed to remove colloidal hazes without stripping of wine. Side benefits include compact lees and improved filterability.

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For more information, contact: **Scott Laboratories, Inc.**, PO Box 750249, Petaluma, CA 94975, tel: 707/765-6666, fax: 707/765-6674; or Canada West, tel: 416/839-9463, fax: 416/839-0738.

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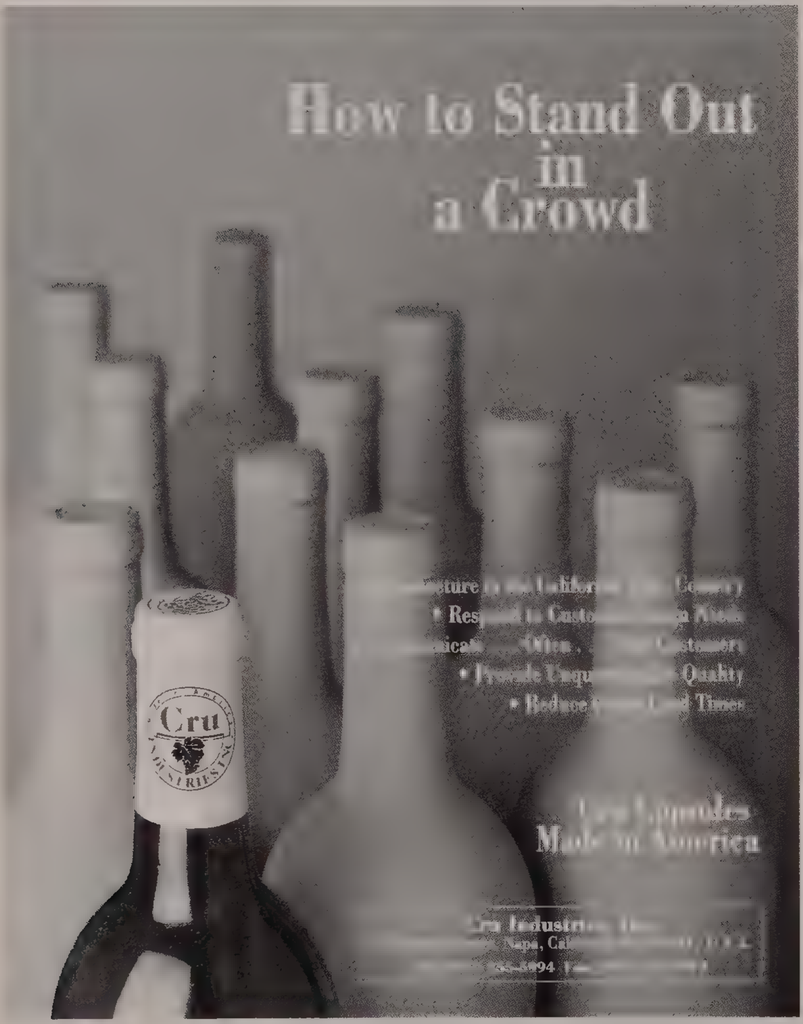

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Strategic alliances

By Conrad Jay Levinson

The lone-wolf entrepreneur of the 1970s and 1980s is not equipped to deal with the marketplace of the 1990s. Today's marketplace expects more in the way of coddling and follow-through than can be offered by the one-man winery.

Entrepreneurs will always provide a cornucopia of ideas, energy, marketing, and ingenuity. But even the best will not be able to provide enough. The heroes and heroines of prosperous wineries in the future will not be independent souls, but **dependent** people who need one another. They will depend on others for expertise, money, people, service, and their own identity of quality.

This dependence will manifest in the form of **strategic alliances** for long- and short-term relationships. The strategy is to increase profits.

Who will be your allies?

- Suppliers
- Competitors for your own area
- Competitors from distant areas
- Other businesses with the same audience
- Other businesses in your community
- Private investors
- Your employees
- Your bank
- Your landlord
- Your service providers

A key to establishing and maintaining strategic alliances will be **cooperation** rather than **competition**. The guerrilla's goal: a network of contacts and colleagues and co-strivers, all helping their profits by building your profits.

Consistent success and growth will belong to teams; not to players. They will possess a strength and durability not dreamed of by the lone-wolf entrepreneur. They will be able to avoid workaholism because they know workaholics are addicted to work and not to results. Teams are addicted to winning.

In order for entrepreneurs to make the transition to a strategic alliance, dependence must be proven by a mastery of delegation — the over-used word and under-used practice.

Strategic alliances combine the essential ingredients for a successful winery. These ingredients encompass technology, inventory, humans, and money. Those are a lot of ingredients. That's why it often takes a lot of allies to form a slam-dunk strategic alliance.

Those allies provide a great deal of value to a winery. That increased value increases its financing power.

When you seek funds from a lending institution, private investor, or venture capitalist, you take on an ally. Because financiers have an investment in the success of your winery, you have to report to them. Lone-wolf entrepreneurs might have trouble doing this, but guerrilla allies won't. In fact, they'll actually welcome the opportunity for objective feedback. They'll have no trouble with a system of checks and balances.

The goal is always **the success of the alliance**. If it is successful, the winery within it will be successful. With the proper allies, winery success rates will soar.

As all guerrillas know, fusion marketing — the shared marketing by several businesses — is a way to increase your marketing exposure while reducing your marketing costs. Strategic alliances flourish with fusion marketing.

One effective example of fusion marketing is a wine tie-in with a food product in a grocery store display. Join a winery association to get exposure along with other wineries through such joint marketing promotions as tasting tour maps for tourists.

In truth, your winery always has many allies: employees, associates, vendors, customers, financial sources, your bank, your CPA, your lawyer, and potentially, many direct competitors outside of your marketing area.

Begin to develop a radar for strategic alliances. Get the knack for spotting the potentially lucrative ones.

In time, they'll be obvious. And you'll no longer be a lone-wolf. ■

(Jay Conrad Levinson is the author of several GUERRILLA MARKETING books and The Guerrilla Marketing Newsletter. His latest book is The Ninety-Minute Hour. To order or request a free brochure, call toll-free 800/748-6444. In Calif. call 415/381-8361.)

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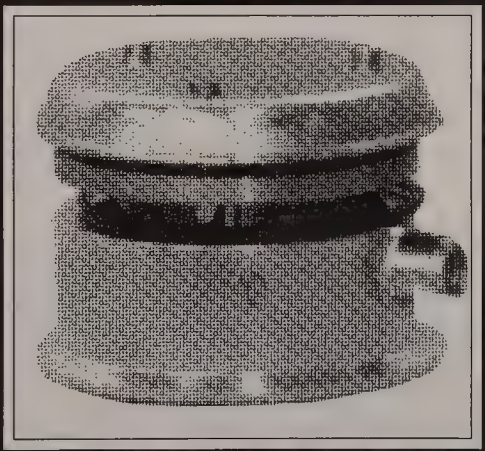

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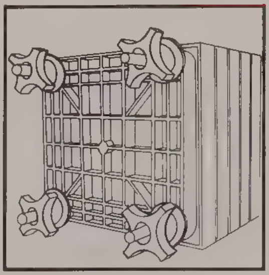

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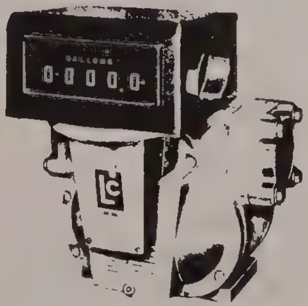

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Sutter Home refines identity

Image permeates every aspect of commerce in America, from seductively wrapped chocolates to impressionistic advertisements for new automobiles. And the wine industry is no exception.

Marketing research indicates that 80% of wine consumers make a buying decision at the point of purchase. In other words, image may influence long-term success — or failure — of every wine brand in the market, particularly since there is often a limited ability on the part of the consumer to discriminate one product from another. Image-intensive products, including wine, spirits, beer, and gourmet foods, depend on carefully designed packaging to send a message of added value to the consumer.

Roger Trinchero, President of Sutter Home Winery, began to address the packaging image of his family-owned winery's premium varietal wines several years ago, when he recognized the opportunity to create a new and unified packaging system to enhance sales of Sutter Home wines.

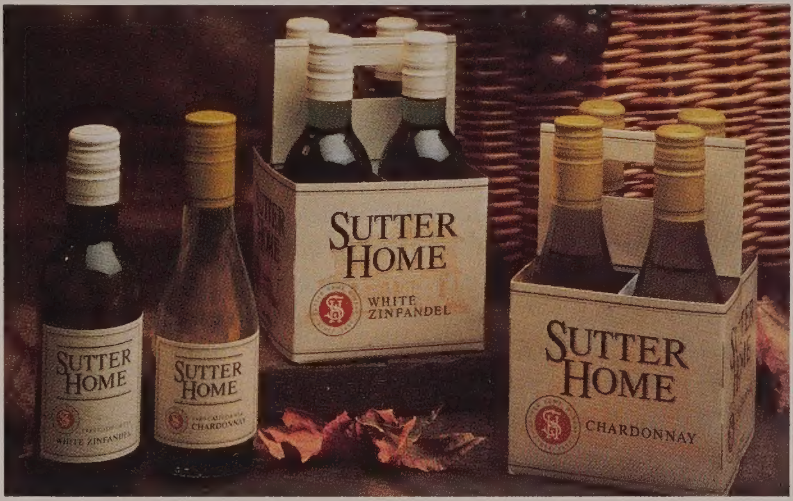
In the 1980s, Sutter Home grew rapidly from a one-wine 'mom-and-pop' operation to a four-million cases/year national brand with a full range of premium varietal wines. Additionally, Sutter Home introduced an upscale single-serving package called the Classic Single in April 1989 and had plans for a Classic Single 4-pack.

"Our old packaging was serviceable," Trinchero explains, "but it was more expressive of our former identity than our new one, which is that of a high-quality, premium varietal wine producer. By the end of the decade, it was apparent that we needed to upgrade our packaging to reflect the expansion and upgrading of our product line."

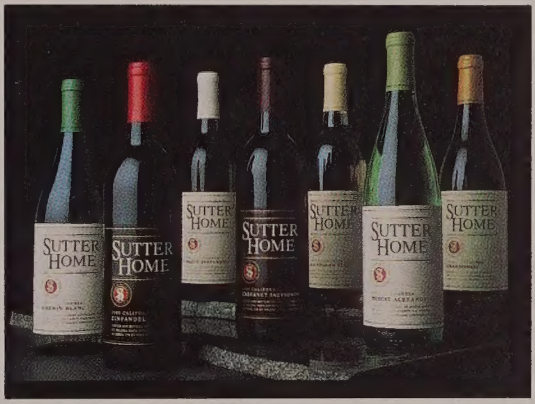
The challenge facing Trinchero was to communicate the more complex identity of Sutter Home wines without confusing or alienating long-standing customers.

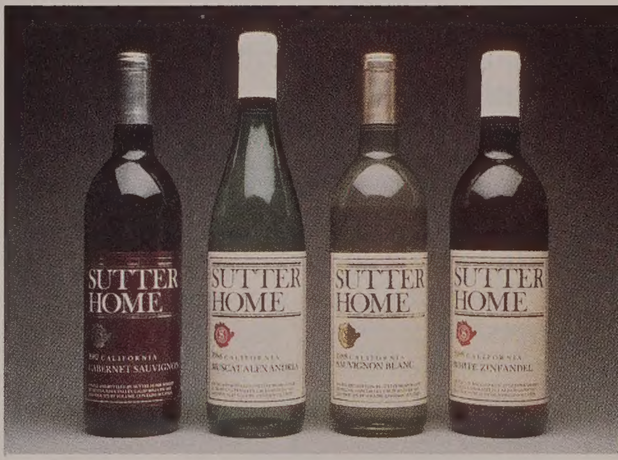
Design team sets parameters

After interviewing several design firms, Trinchero selected Landor Associates, the international design and identity management consulting firm based in San Francisco, CA, to direct the design project. A Landor senior project team began evaluating Sutter Home's label image in January, 1990.



TOP: Classic Single 4-pack carrier for 187mL bottles. LEFT: Newly redesigned labels. RIGHT: Old labels. BELOW: New shippers have different ink colors.





The group's first assignment was to establish objectives in redefining the image of Sutter Home. These goals, which reflected the winery's priorities included:

- A packaging system for Sutter Home's 750mL and 187mL products (including shippers) that would simultaneously boost the winery's mass-market brand identity and convey premium varietal quality cues.
- An image-intensive package design insuring maximum visual impact in both the retail environment — *i.e.*, shelf sets and floor displays — and in on-premise venues.
- Maximizing the recognizability and memorability of the Sutter Home label.
- An evolutionary rather than revolutionary refinement of the package — *i.e.*, to retain worthwhile features of the existing design and refine them to enhance an image of quality and tradition. This evolutionary approach would serve to reassure long-time customers that the winery and its products were not undergoing a major overhaul.

- A harmonious overall effect, so that the consumer's eye would track through the package as effortlessly as possible — *i.e.*, from brand identity to product descriptors to mandatory information.

Analysis produces solution

Having established parameters, the Landor team began a strategic analysis of Sutter Home's existing identity, including a review of winery history, brand development, product characteristics, short and long-range marketing plans, current consumer attitudes to the brand, and review of the packaging and marketing strategies of competitors. Field audits were conducted to assess the retail wine environment.

According to Ed Rice, Landor's Director of Marketing, "Our analysis indicated that the Sutter Home logo, or 'identity', was firmly established in the consumer's mind. However, it was not always read completely because of the flush-left placement of the words 'Sutter Home' on the label."

After exploring several typographic options, the solution came in effecting a more balanced presentation of the winery's name, conveying stature while retaining the tone of the original logo.

"The Sutter Home seal presented an interesting challenge," Rice says. While the seal needed to remain on the label as a symbol of excellence, it confused customers because they didn't recognize the element as a 'simulated wax seal, like one made by a signet ring'. The message of refinement and quality was clarified with a new version in the shape of a stamped seal of approval.

From drawing table to shippers

Several design options were presented to Sutter Home management in three-dimensional models. With a final design selected, the next major phase began: translating the newly created label design to shipping containers and Classic Single 4-pack carriers.

"There were additional wrinkles to work out at this stage," Rice notes. "We were particularly concerned that the 4-pack might resemble a wine cooler package, which would be the worst possible signal to send because it would cause consumer confusion or indifference."

Although the term 'secondary packaging' is used to describe shippers and carriers, these items are of equal importance in the context of creating a total packaging communication system, because they can play a pivotal role in breaking through merchandising clutter in such environments as warehouse club stores and hypermarkets.

To send the proper message, the design team used 'wine correct' colors in creating the 4-pack carriers. Finding appropriate colors involved identifying a color's esthetic appeal and the taste message conveyed. For example, red wine is represented by shades of burgundy, while cream colors denote white wine.

Landor's designers searched for more interesting hues than simple cream and burgundy for Sutter Home's wines. Straw-yellow was chosen to convey the light fruitiness of White Zinfandel. Deep burgundy was selected to represent the refined Cabernet Sauvignon, and midnight black to symbolize red Zinfandel with robust and rich flavors.

Next, a watermark-like rendering of the Sutter Home Victorian was added to communicate the authenticity of the product's origin — a place of quality, tradition, and craftsmanship.

The redesign began appearing in July 1990 with introduction of the 4-pack, which displays the updated Sutter Home logo, seal, and watermark. The totes and bottle capsules are color-coded for easy identification of the four Classic Single bottlings: White Zinfandel, Cabernet Sauvignon, Chardonnay, and Sauvignon Blanc.

In fall 1990, Sutter Home varietals in the 750mL size began appearing with the new label and shipper design. By spring 1991, the new packaging will have completely replaced the old version.

"We have realized our goal of developing a full-line brand image," says Trinchero. "Sutter Home products now appear unified and harmonious in brand shelf sets, contributing to the consumer's perception of Sutter Home as a high-quality premium varietal wine brand."

Sutter Home feels their label redesign was successful. What do you think? ■

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